July 24, 1961

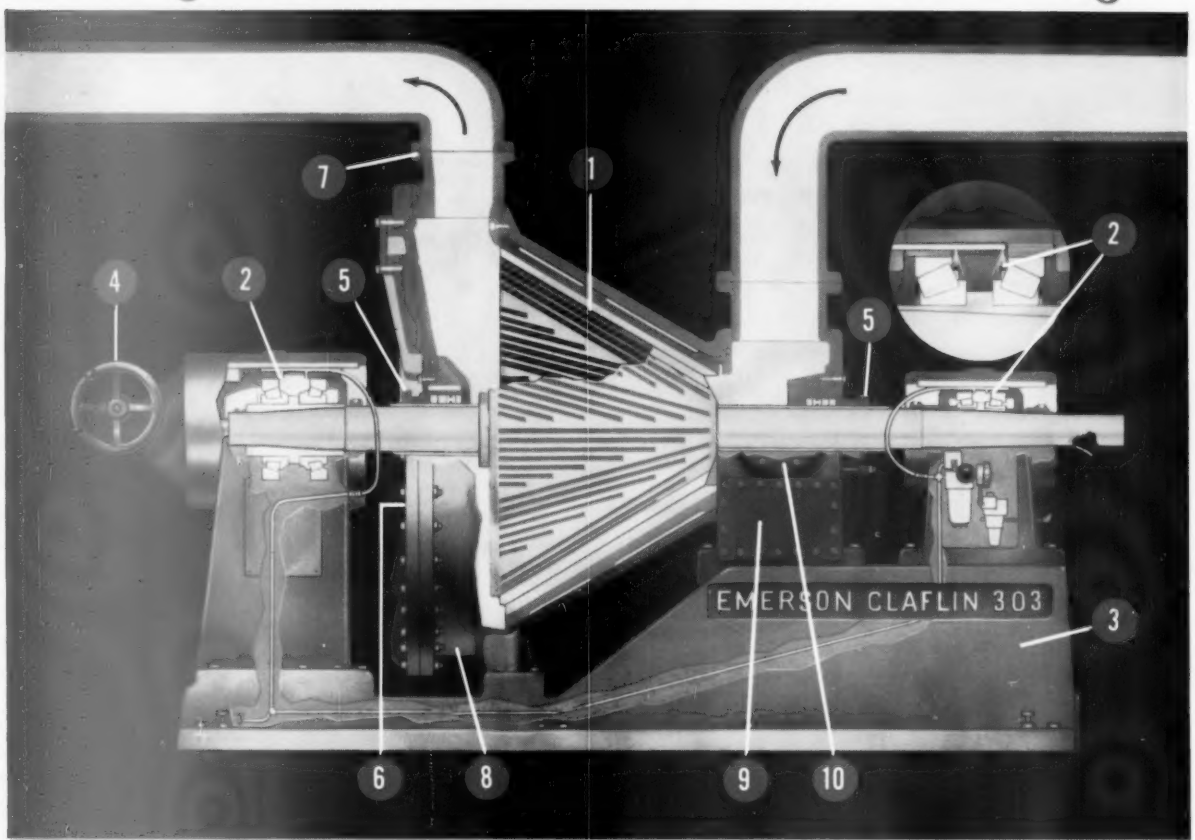
PULP & PAPER

WORLD REVIEW 1961

WORLD LEADERS IN PAPER AND PAPERBOARD PRODUCTION 1960 (short tons)

U.S.A. 34,282,000 / **Canada** 8,617,267 / **Japan** 4,974,000 / **United Kingdom** 4,561,881 **West Germany** 3,786,530 / **Soviet Union** 3,549,150 / **France** 2,884,056 / **Sweden** 2,371,000 / **Finland** 2,180,000

Have you looked **into** an Emerson Claflin lately?



1. Wide tackle selection 2. Oil mist lubrication 3. Sturdy construction 4. Micro-feed plug positioning 5. Water-cooled packing boxes 6. Large 2-piece head 7. Stock outlet cast in shell 8. Tangent cleanout 9. Sand trap 10. Hand hole

In stock preparation, no conical refiner can match the results obtained from the Emerson Claflin for several reasons. For example, a wide choice of tackle enables selection of just the right one to give you the desired physical results regardless of the furnish being run.

For high development — Develomax sectional or fabricated fillings
For rough stock refining — cast fillings
For defibering and refining — deflector type fillings
For controlled cutting and defibering — stainless steel fillings
For rejects — dam type or abrasive fillings
For maximum refining — lava fillings

Operating performance is another reason. Claflins are equipped with a built-in oil mist system of continuous, automatic lubrication, which feeds both double anti-friction roller bearings from a single reservoir. Constantly flowing oil mist keeps dirt out, conserves oil, eliminates lubrication downtime.

Sturdily built throughout, Claflins withstand up to 100 psi with virtually no vibration. Positive control over plug settings is held to .0005 inch by micro-feed handwheel adjustment. Coupling has full travel slide feature. One setting lasts the life of the filling. Water-cooled packing boxes protect against stock leakage.

Maintenance is simple. Large shell head is designed in two pieces for ease in changing fillings. Plug is removed without dismantling bearings. Stock outlet is cast as part of the shell, so mill piping need not be disturbed. Tangent cleanout is aligned to the direction of stock flow for quick and easy flushing. Sand trap and inspection hand hole are conveniently located at the stock inlet.

Widely recognized for its extreme versatility, the Emerson Claflin is proving daily its capabilities on an unlimited range of furnishes — screen rejects and fine papers, bag, wrap and multiwall, tissue and towel, corrugating, food and container board, boxboard and liner board, boxboard filler, roofing, hot stock and others.

Four sizes of Emerson Claflins cover an HP range of 5 to 500, RPM range of 350 to 1200 and tons per day range of 1 to 200.

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Only Emerson Makes the Claflin

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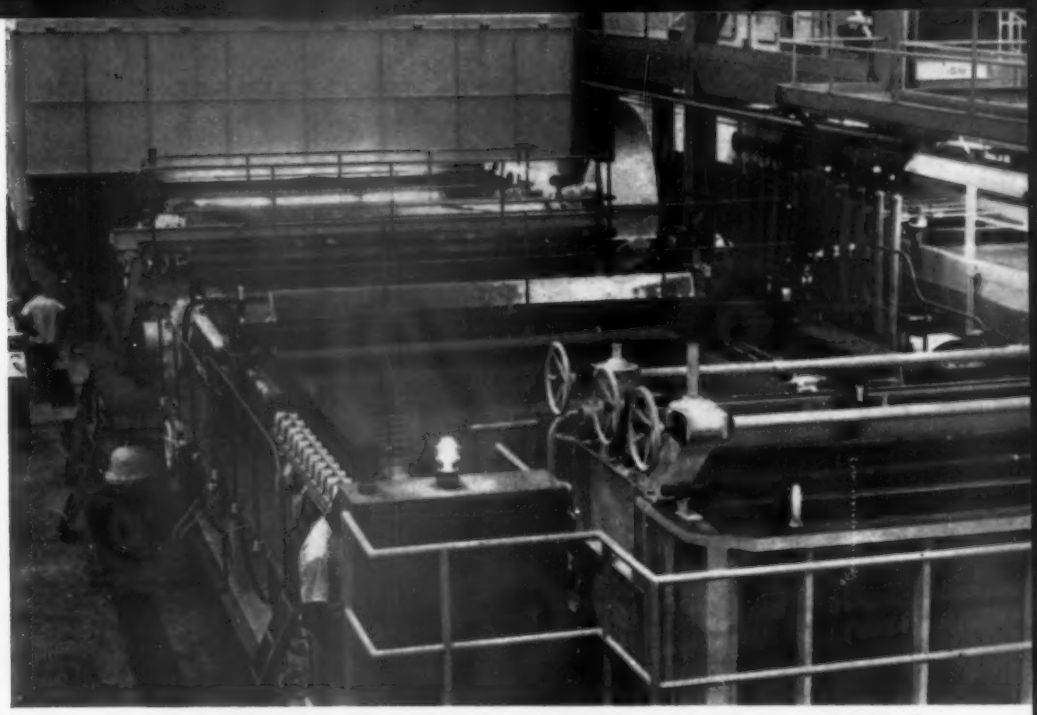

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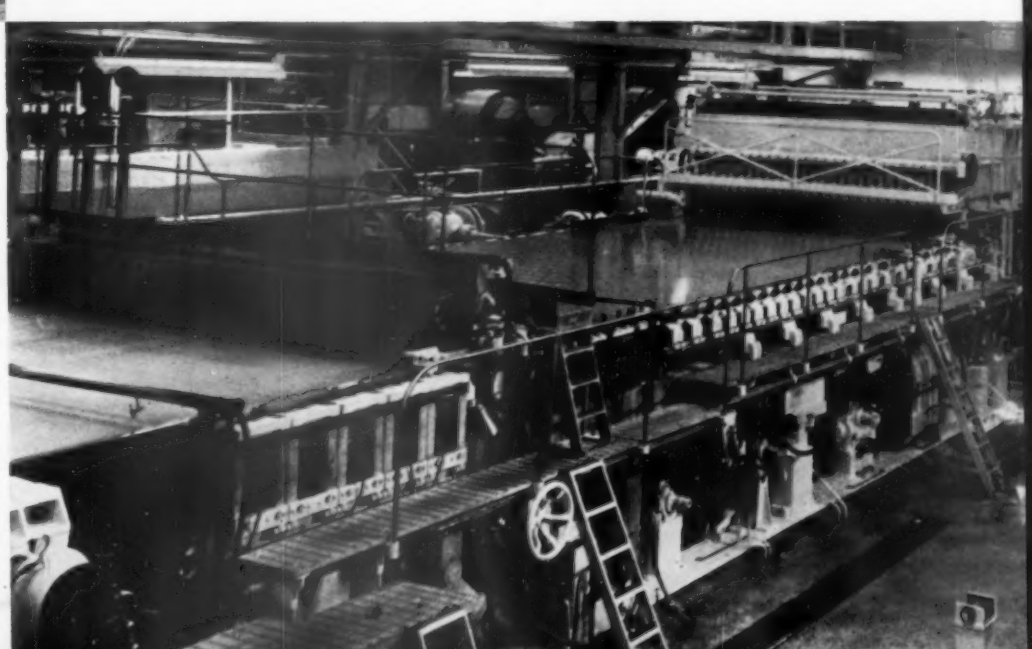

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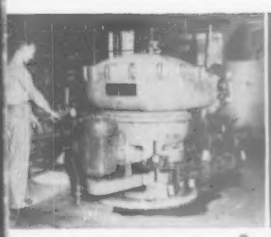
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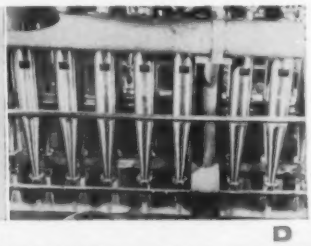
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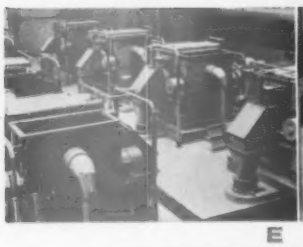
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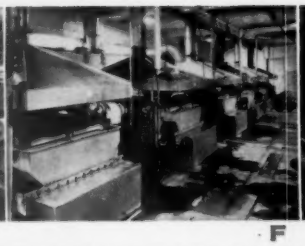
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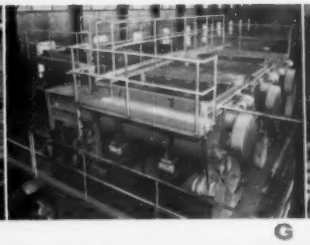
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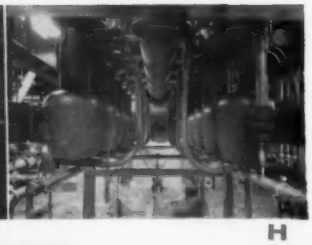
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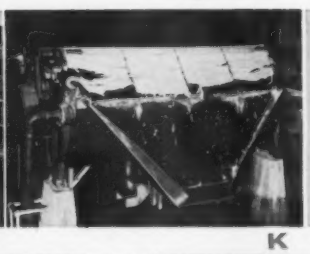
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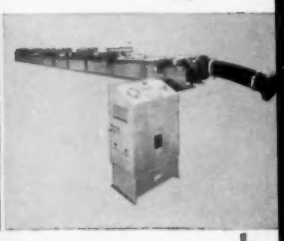
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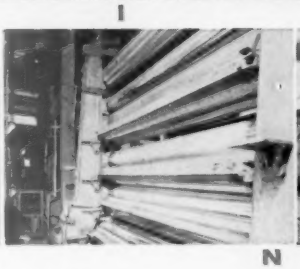
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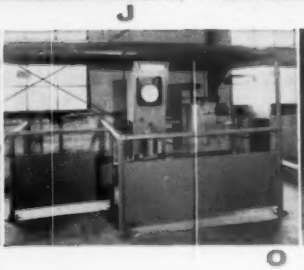
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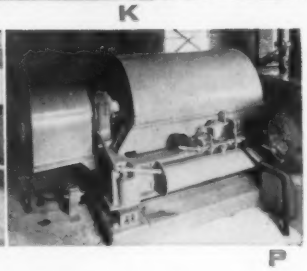
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A Model 14

B Model 10

C Model 6

BIRD CENTRISCREENS now built in three sizes, for super-efficient pressure screening of large or small volumes of stock at low overall cost per ton.

D **BIRD CYCLEANS** for highly effective and economical removal of shives and fine dirt, improved hydration, reduced breaks and increased output.

E **BIRD VIBROTOR SCREENS** for handling big volumes of stock through slotted plates at high consistencies in small space.

F **BIRD JONSSON SCREENS** for high capacity, high efficiency knotting and perforate plate screening of pulp, building board, straw and waste stocks.

G **BIRD ROTARY SCREENS** for fine, slotted plate screening to assure constant production of uniform quality, well formed paper.

H **DIRTECS** for removal of heavy, gritty dirt particles that do damage to wires, rolls and pumps and increase rejects. Available in regular or "King" size.

I **BIRD CENTRIFFLERS** for prompt, thorough removal of junk and heavy dirt from stock as it leaves the pulpers; provides low cost protection of papermaking equipment.

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N **VICKERY DOCTORS** in twelve different designs to assure correctly engineered application to each and every roll.

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1961 WORLD REVIEW NUMBER

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Conversion Factors

1 short ton = 2,000 lbs.
1 metric ton = 2,204.6 lbs.
1 long ton = 2,240 lbs.
1 short ton = 0.90718 metric tons
1 metric ton = 1.1023 short tons
1 short ton = .892 long tons
1 long ton = 1.12 short tons
1 metric ton = .9842 long tons
1 long ton = 1.016 metric tons
1 kilogram = 2.205 lbs.

1,000 kilograms = 1 metric ton
1 cord of wood = 2.55 cubic meters
1 meter = 39.37 inches
1 cord = 90 cubic feet (not counting air space)
But usually air space is counted, therefore
1 cord of wood = 128 cubic feet
1 cord of wood = 3.62 cubic meters
1 hectare = 10,000 square meters
1 hectare = 2.47 acres
2 cords wood = about 1,000 board ft.

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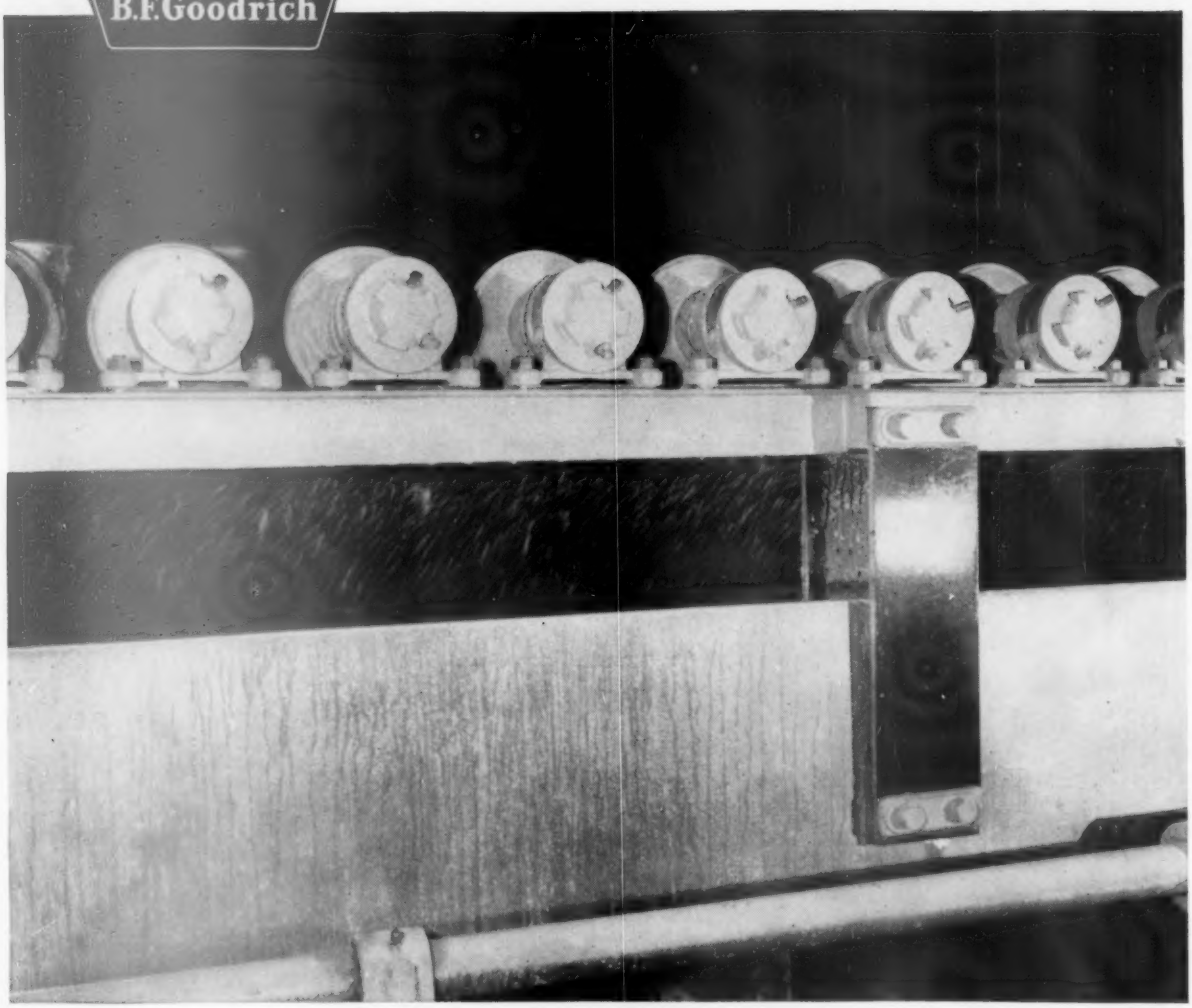
B.F.Goodrich



Spotting stops when water goes down, not around

THOSE B.F.Goodrich Dukbak table rolls shed water fast, throw it down and away, not back up against the wire. Even rolls running at 1000 feet a minute need no deflectors. As a result water is removed more uniformly, there's no danger of water spotting the sheet, paper formation is improved.

B.F.Goodrich Dukbak rolls are dynamically balanced to prevent whipping even at highest speeds. They are ground straight and true, move evenly with the wire without developing high or low spots. The sheet that's produced is smooth, uniform.

In addition to better performance, B.F.Goodrich Dukbak table rolls have many other cost-saving advantages. Cover separation is impossible because the rubber is locked to steel by the patented Vulcalock process, the strongest rubber-to-steel adhesion known today. Corrosion is impossible because the ends are sealed against moisture. And, after years of hard service, Dukbak rolls can be reground as good as new.

Let a B.F.Goodrich man show you how these longer-lasting rolls can improve the quality of your paper. And if you are buying a new fourdrinier, or having one rebuilt, be sure to specify B.F.Goodrich Dukbak to your machine builder. *B.F.Goodrich Industrial Products Company, Department M-177, Akron 18, Ohio.*

B.F.Goodrich *paper mill rolls*

PULP & PAPER 1961 WORLD REVIEW NUMBER

Greatest Paper Year

Pulp and paper each increase 4½ million short tons in one year —new world records: over 82,000,000 short tons of paper and paperboard, over 66,000,000 short tons of pulp

Boom in West Europe accounts for most of increase; Communist nations increase production at a slower pace

Japan, United Kingdom, West Germany, France, Sweden—in order—are biggest gainers in paper; each one adds more paper tonnage than United States, and twice to five times as much as Soviet Union

In pulp, biggest increase was in U.S.A., followed by Sweden, Japan, Canada. These nations gained twice to more than four times increase in Soviet Union

By ALBERT W. WILSON
Editor, PULP & PAPER and Editorial Director, PULP & PAPER INTERNATIONAL

New York

The year 1960 was by far the greatest in pulp and paper making history.

With 1961 more than half over as this is written, this year shows promise of being just as big a year or maybe even bigger.

But the jump from 1959 was phenomenal, and most of it due to the great paper boom of Western Europe. For a total of 12 months of the past two years, the writer toured all of these Western European paper producing nations, and some in Eastern Europe, including Russia, witnessing the gains that each was making. In all countries, paper machines were being pressed into service, but mostly the real urgency to raise production was in Western Europe. The Soviet Union and the Eastern Communists countries showed increases, but at a slower pace.

In Western Europe—a very small but culturally advanced area of the world—an amazingly hungry appetite was developing for paper packaging, printing papers and many other kinds of papers. None of scores of European paper manufacturers I talked with expect that a 10 to 14% rise in one year (1959 to 1960) in paper consumption in these Western European nations can be maintained—but consumption will keep growing. Presently it is growing faster than in America, which used to consume more than half—but now considerably less than half—of the world's paper.

Paper and paperboard production throughout the world in 1960 was 82,028,357 short tons (73,825,520 metric tons). This represents a tremendous surge forward of 4,285,000 short tons beyond the previous record of 1959. Such a great increase is unlikely to happen again for a while, possibly several years at least. Most of the advance was in 14 nations of Northern and Western Europe (Austria, Belgium, Holland, United Kingdom, Ireland, Spain, Portugal, Italy, West Germany, Switzerland, Sweden, Finland, Norway and Denmark)—over 2,019,018 short tons. In Eastern Europe the gain was much smaller—(Russia, Poland, Czechoslovakia, Hungary, Bulgaria, Yugoslavia, Rumania, Greece, Turkey, and Albania) —only 317,810 short tons.

Pulp Production Sets Great Record

In the production of all kinds of pulps, woodpulp, bamboo, esparto, bagasse, straw (both for mill conversion and for sale, but not counting waste paper), the world production also broke all previous records, reaching a new high level in 1960 of 66,-210,000 short tons (nearly 60 million metric tons). This was another phenomenal gain in just one year—a gain of about 4,600,000 short tons over 1959.

In the case of pulp, in contrast to paper, the big gain was in North America. In the United States, the increase was one of the greatest ever

made in any country– about 900,000 short tons (but much less than the 2½ million ton jump made by U.S.A. for 1958-1959). In Canada it was over 500,000. In Sweden, production was up about 635,000 tons, in Japan nearly 580,000 and in Russia, about 210,000.

The Scandinavian countries, United States and Canada were the very active in 1960–and as they are in 1961 at about the same pace–in feeding pulp to the paper-hungry Western European nations. The story of world trends in pulp supply is told in another section of this WORLD REVIEW.

The Amazing Story of Paper

In papermaking, the world's story is just as fabulous as anyone suspected.

But many of the Europeans I visited could hardly believe it would come true. Seeing the actual figures, gathered together in this worldwide survey, which this magazine has been conducting every year for the past 11 years, dispels all these doubts. The facts are clearly to be seen.

Japan made a phenomenal advance in its own right–nearly 760,000 short tons–by far the greatest gain of any country. It was again a reminder of the tremendous recovery in this energetic nation since the war–but it grew so fast in the last year that pains of over-supply were suffered to some extent.

The United Kingdom was next, having stepped up its paper and paperboard production by 470,000 short tons. Early this year, it still was gaining, but not so fast, and many of its mills were deeply concerned over the increasing imports from Scandinavia and Austria as they both benefit from frequent reductions of duties within the European Free Trade Association.

The aggressive West German industry added a remarkable 356,000 short tons of production in 1960 over 1959, and here, also, the manufacturers show some concern over the rate of imports from neighboring European countries.

France, Sweden and Finland each showed gains in paper production over 1959 of more than 300,000 short tons.

It is really something new in paper history annals to report that all of these nations showed greater increases than the United States. The history of American paper production has been one of tremendous growth in many past years. But the rate of growth in the last 30 years hasn't been as fast in the U.S.A. as in the first 30 years of this century. And in 1930, only 230,000 short tons, a rise of less than 1%, was shown. In Canada, the increase was only 130,000 tons.

It is a new experience for anyone who has followed paper industry statistics over many years to see this strong shift to Western Europe. Some credit certainly must go to the development of the new market blocs in Europe, the Common Market or European Economic Community (the Inner Six nations) and to the European Free Trade Association (the Scandinavians, United Kingdom, Austria, Portugal and Switzerland). At paper offices and mills I visited in all of these member countries, there was ready agreement that general economic conditions in Europe were greatly stimulated by these continuing programs for import duties reductions.

But some of this increase, they also said, was incidental. They said the trade blocs came into force just at the moment when Europe was awakening to the advantages of paper and its many desirable uses.

In the Soviet Union, the increase over 1959 of paper and paperboard production, according to their own official figures, published in detail for the first time in this REVIEW NUMBER, was only about 150,000 short tons. This is still about 10,000 tons short of what the increase was between 1958 and 1959 and furthermore, the programmed expansion for paper and paperboard capacity during this year of 1961 calls for a similar moderate increase–bringing the Soviet Union's capacity by the end of 1961 to 3,812,930 short tons.

The Soviet Union, and its Communist neighbors, Poland, Czechoslovakia, East Germany, Hungary, Rumania and Bulgaria–all together–did not gain as much in paper production in 1960 as any single one of the Western or Northern European nations. Italy, another important member of the Common Market,

Much publicized percentage gains in the Soviet Union in recent years have given a distorted picture of its paper industry growth. Likewise its pulp industry, which rose only 208,560 tons in 3,567,960 short tons in 1960. A good gain, compared to many lesser countries, but not phenomenal. And the growth of its industry is likely to be usually at such a pace, except perhaps when the big forest products combines or centers in the Urals come into production.

When I was in the Soviet Union, twelve new mills were under construction. One was for coated magazine paper, others for paper and board, some in the South using the tall-growing cellulose-rich reeds of the Volga basin, and others in the Ural Mountains. These are only coming into production.

Greatest Growth Not in Backward Areas

But Soviet Russia and the Communist nations are no different basically, than many of the new nations of Africa and Asia, and the Latin American countries, where there is a long, long way to go. Production increases year by year are not great, as the records this magazine has kept since 1950 demonstrate clearly. Countries with very low per capita paper consumption figures, such as from 1 to 30 pounds, are still potentially great long-term future markets for paper.

But the biggest and most significant increases in these recent and probably in these near-future years will still be in the more culturally advanced countries–those in Western Europe, for example.

There were only a few countries which showed a decline in paper production in 1960. Spain, the Argentine, Cuba, for example. There were economic and political reasons for these slight declines, but in Spain and Argentina new machines are going into production, Spain has been admitted to the OEEC and its successor organization and this turned the tide in its economy upward. Argentina has been battling serious inflation and other problems, but it will make gains in paper.

Mainland China–Communist China –with its vast population and many small mills and hand paper mills, has an estimated paper production close to the 2,000,000 tons-per-year countries of West Europe and it is buying Western European paper machines. Since becoming a Communist country, it has made its own paper currency, formerly done in U.S.A. or British mills, and this in itself is quite a sizable addition for such a large country's paper capacity.

Communist China's gain last year in paper production was estimated about the same as that of The Netherlands, home of greatest straw paper industry of the world, which was about 90 thousand tons, or Norway, or East Germany, with 80,000. Poland, Austria, Switzerland, India,

Australia, Brazil, Belgium, Yugoslavia, Taiwan and Mexico are countries which showed gains in paper output ranging downward from 60,000 to 30,000 tons and in past years these would be considered quite good growth for most smaller countries.

Paper Usage Per Person

This is probably the most fascinating part of the WORLD REVIEW's statistical efforts of our editors and correspondents. Some rather startling contrasts are brought to light. It has often been said if some great teeming Asiatic nation of 600 or 400 million people would just start using one half pound or even one pound more per person of paper, the demand would

How Nations Rank in Per Capita Paper Consumption

Copyrighted 1961

Latest 1960 statistics for paper and paperboard gathered from 101 nations and territories

	Population (1960)	Per Capita Consumption in lbs. (1960)
1. United States	180,500,000	431.6
2. Canada	18,000,000	280
3. Sweden	7,494,000	265
4. United Kingdom	52,383,000	236
5. Denmark	4,600,000	198
6. Switzerland	5,411,000	195
7. Netherlands	11,500,000	185.2
8. Norway	3,587,000	180.4
9. New Zealand	2,377,000	177
10. Australia	10,380,000	176
11. West Germany	55,600,000	174
12. Finland	4,456,000	155.9
13. Belgium	9,180,000	137
14. France	45,400,000	127
15. Austria	7,083,500	102.5
16. Japan	93,406,830	102.5
17. Puerto Rico	2,353,000	97.7
18. Iceland	177,100	92
19. East Germany	18,200,000	92
20. Ireland (Eire)	2,834,000	90
21. Cuba	6,900,000	73
22. Argentina	20,500,000	64.4
23. Italy	51,151,903	63.3
24 South Africa	15,000,000	59
25. Israel	2,150,000	56.5
26. Hong Kong	2,900,000	49
27. Poland	29,731,000	47.1
28. Venezuela	6,500,000	44
29. Singapore	1,634,100	42.2
30. Uruguay	2,950,000	42.1
31. Rumania	20,100,000	42
32. Hungary	10,021,000	40
33. Taiwan	10,863,812	39.4
34. Czechoslovakia	13,648,864	36
35. British Honduras	73,800	35
36. Russia	214,400,000	33.2
37. Mexico	35,000,000	32.1
38. British Guiana	480,000	27
39. Spain	30,128,056	26.4
40. Greece	8,500,000	26
41. Lebanon	1,550,000	23.8
42. Portugal	9,280,000	23
43. Brazil	65,743,000	21
44. Panama	1,067,766	21
45. Chile	7,550,991	20.5
46. Yugoslavia	18,500,000	19.8
47. Bulgaria	8,124,000	18
48. Surinam	313,600	17.6
49. Albania	1,450,000	17
50. Malaya	7,015,000	15.5
51. Costa Rica	1,199,116	14.5
52. Cyprus	565,000	14
53. Peru	10,524,000	14
54. Colombia	13,824,000	11
55. United Arab Republic	30,000,000	10.7
56. West Indies Federation	4,100,000	10
57. Philippines	24,500,000	9
58. Fed. of Rhodesia & Nyasaland	8,430,000	8
59. Guatemala	4,000,000	8
60. Nicaragua	1,450,000	8
61. El Salvador	2,520,000	7.6
62. Iraq	7,000,000	7.5
63. Ecuador	4,320,000	7.5
64. Libya	1,200,000	7.5
65. Turkey	26,880,000	6.6
66. Ceylon	9,612,000	6.1
67. Morocco	10,780,000	6
68. Dominican Republic	4,070,108	6
69. Bolivia	3,462,000	5.6
70. Iran	21,200,000	5.6
71. Thailand	23,750,000	5.3
72. French Guiana	30,000	5
73. South Korea	22,974,000	5
74. South Vietnam	13,840,000	5
75. Honduras	1,987,623	4.6
76. Paraguay	1,718,000	4.2
77. Indonesia	92,000,000	4
78. China	669,000,000	4
79. Laos	2,626,000	3.5
80. Congo Republic	14,000,000	3.2
81. Haiti	3,500,000	3
82. Cambodia	4,950,000	2.6
83. Pakistan	93,800,000	2.4
84. Sudan	11,615,000	2.4
85. Burma	20,457,000	2.1
86. Portuguese Africa	13,500,000	2
87. Nepal	9,090,000	2
88. Ghana	5,200,000	2
89. Nigeria	35,000,000	2
90. North Korea	2,000,000	2
91. India	470,000,000	1.6
92. Uganda	6,536,616	1.5
93. French West Africa	18,934,000	1.5
94. North Vietnam	13,130,000	1
95. Sierre Leone	2,500,000	1
96. Liberia	2,500,000	.6
97. Upper Volta	3,520,338	.6
98. Ethiopia	21,400,000	.5
99. Afghanistan	13,130,000	.5
100. British South Africa	1,250,000	.5
101. Somalia Republic	2,500,000	.5
Rest of Africa	40,000,000	1.5
Total World	2,963,000,000	55.2

Fluid Power news

OILGEAR 40 Years of Fluid Power

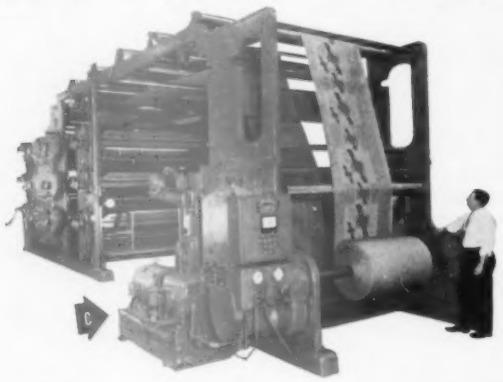
Report No. 12,301 — From Oilgear *Application-Engineering* Files

HOW OILGEAR *Any-Speed* DRIVE SYSTEMS ON *SCHMUTZ* 6-COLOR PRINTING PRESSES HELP BOOST PERFORMANCE, EFFICIENCY, ECONOMY, CONVENIENCE — IN LESS SPACE

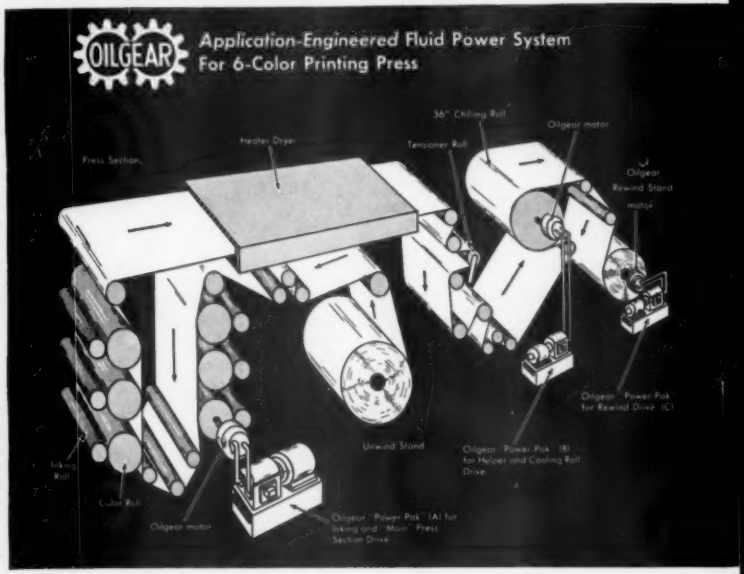
CUSTOMER: *Schmutz Manufacturing Company, Louisville, Kentucky.*

PROBLEM: Main and rewind drives with control systems for web-fed, 6-color printing presses for printing packaging stock — from 50 or 60-lb kraft, to container and food board. Web widths vary from 40"to 84", with impression "repeat" varying from 14" to 84".

REQUIREMENTS: 1. Constant or absolute tension on the press section to provide "dot-to-dot" register over an infinitely variable (stepless) speed range from 0 to 1000 feet per minute . . . and hold set speed and tension without variation regardless of fluctuations in load, electrical power input, or temperature. 2. Provide either constant or tapering tension for rewind — from 4" cores to 40" or 60" dia. rolls. 3. Must be economical from the standpoints of installed cost — operation and maintenance — floor space — and electrical power input. 4. Clean, quiet operation — with minimum heat dissipation. 5. To be "packaged" or pre-assembled for simplicity and speed of installation. 6. Eliminate, if possible, the long lineshaft drive that "closed up" one side of the press. 7. Be capable of dependable, trouble-free, continuous, 'round-the-clock operation.



ABOVE: Rewind end of an Oilgear-equipped, 84" Schmutz High Speed Press — with 84" maximum impression repeat, speed range from 0 to 1000 fpm — with constant acceleration and deceleration rates. Oilgear Rewind Drive, indicated, can hold in stalled condition indefinitely — follow press speeds and rewind from a 4" core to 60" roll. The variable, constant or drooping tension characteristics with absolute constant or decreasing tension — without any steps whatsoever — enable this Oilgear-powered 6-color press to hold register closer than previously experienced.



SOLUTION: Three separate Oilgear Servo-Valve-Controlled Pump and Motor Drives to provide stepless, infinitely variable speed control. Fully interlocked feedback systems hold speeds and tensions to a new high degree of accuracy unobtainable with the adjustable speed electrical drives formerly used. An Oilgear "Plus" feature — "memory" — permits the press to be stopped for periods of several hours, and if not reset, will automatically resume operation at the identical former speed and tension. Space requirements are drastically reduced — *Oilgear Direct-Drive,* Fluid Power Motors are smaller than the gear reducers formerly required — and space consuming power rectifiers are eliminated. Operating economy has been improved — Oilgear Drives use less than ½ the former input power. Oilgear Drives do not require high-speed blowers for cooling — are whisper-quiet in operation . . . can hold stall-speed indefinitely without overheating. Another advantage—*lower installed cost.* These are some of the major advantages that help convince Schmutz to "join the swing" to Oilgear Drives and Control Systems . . . user satisfaction is, of course, the ultimate factor.

For example, one Schmutz customer reports — *"Our press is in operation 24 hours per day — 6 days per week. We can measure our Oilgear maintenance in nickels per year . . . with previous drives we had to carry $1000 worth of tubes in stock."*

This is merely one of innumerable "problem drives" solved by Oilgear Application-Engineering teamwork — and Oilgear ANY-SPEED Drives and Control Systems . . . for new standards of performance — greater accuracy, precision control of speeds, torques, tensions . . . for new economy of operation, installation, maintenance, and valuable floor space . . . for longer, more dependable life. These are sound, basic, *installation-proved* reasons why there are more and more Oilgear users in the paper, printing and converting, marine, food and beverage, chemical, pharmaceutical, primary metals, metal-working, textile, rubber, military, and other industries who all agree that . . .

"for the lowest-cost-per-year . . . it's OILGEAR!"

For practical solutions to YOUR rotary or linear drive and control problems, call the factory-trained Oilgear Application-Engineer in your vicinity. Or write, stating your specific requirements, directly to . . .

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Application-Engineered Fluid Power Systems

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require the building of many more mills to meet these needs!

This is true. Compare the 1960 per capita consumption figure of 431 lbs. per person in the United States, for example, with Communist China's 4 lbs. per individual or India's 1.6 lbs.

Canada is next to the U.S.A. with 280 lbs, Sweden and Great Britain are now both over 200, and there are twelve countries in the 100 to 200 lbs. per person range, and these are all Western European nations except for Australia, New Zealand and Japan.

This is a new per capita table of great interest and worth further study.

Interesting Facts about Paper

As our table shows, the United States' production of 34,282,000 short tons of paper in 1960 was 41.8% of the world's total of 82,028,357 short tons. Of course, the United States imports about 5,000,000 short tons of Canadian newsprint which brings its consumption to a higher figure, but still less than half of the world's consumption.

The U.S.A. paper production was greater than the next nine highest ranking nations combined, and this includes the Soviet Union, with a greater population than U.S.A. has. Canada is second, with 8,617,267 short tons, but Japan showed big gains in third place to reach 4,974,000. United Kingdom, West Germany and Russia were the only other nations over the 3 million mark, and the first two widened their lead over Russia.

U.S.A. and Canada made 42,899,267 short tons of paper, as compared to Europe's 28,257,072. Back in 1956, U.S. and Canada had a bigger spread, 39,932,000 to Europe's 21,678,000. This demonstrates the greater gains of Europe in these five years. Asia is far behind, with 7,862,715 short tons in 1960.

All Nations Producing Paper and Paperboard – How They Rank

Combined production figures for 71 producing nations in short tons of 2000 lbs.

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	1956 (Short Tons)	1959 (Short Tons)	1960 (Short Tons)
1. United States	31,428,155	34,051,000	34,282,000
2. Canada	8,504,448	8,584,470	8,617,267
3. Japan	2,830,885	4,219,000	4,974,000
4. United Kingdom	3,618,266	4,094,912	4,561,881
5. West Germany	2,955,398	3,430,551	3,786,530
6. Russia	2,839,100	3,399,440	3,549,150
7. France	2,140,900	2,575,200	2,884,056
8. Sweden	1,733,000	2,062,000	2,371,000
9. Finland	1,684,000	1,881,000	2,180,000
10. China	1,728,500	1,930,000	2,110,000
11. Italy	1,023,080	1,392,000	1,619,000
12. Netherlands	931,251	1,033,047	1,122,829
13. East Germany	680,000	780,000	867,000
14. Norway	650,654	787,368	869,513
15. Poland	436,810	646,300	705,300
16. Czechoslovakia	485,000	649,254	674,223
17. Austria	556,498	589,721	651,990
18. Australia	396,557	513,000	555,520
19. Switzerland	407,000	468,000	529,000
20. Brazil	377,500	484,790	511,500
21. Belgium	370,525	410,000	453,000
22. Mexico	346,000	420,000	450,000
23. India	216,609	327,040	379,747
24. Argentina	289,332	380,901	360,800
25. Spain	286,880	374,000	360,000
26. Yugoslavia	128,468	172,000	192,500
27. South Africa	130,000	202,570	224,937
28. New Zealand	121,262	180,500	203,010
29. Denmark	160,000	190,000	200,000
30. Taiwan	67,594	126,323	155,807
31. Rumania	230,000	139,700	154,000
32. Hungary	100,000	136,298	153,136
33. Cuba	80,000	160,000e	150,000e
34. Chile	59,436	102,955	121,836
35. Portugal	80,791	95,590	120,000
36. Greece	50,000	75,000	93,500
37. Ireland (Eire)	70,900	89,600	92,064
38. Pakistan	33,600	45,129	76,781
39. Turkey	53,112	67,247	75,000
40. United Arab Republic	22,000	56,540	60,000
41. Bulgaria	59,830	62,370	59,400
42. Peru	36,000	55,000e	55,000
43. Colombia	46,000	46,000	46,000
44. Venezuela	14,000	16,250	44,000
45. Philippines	20,000	35,695	43,400
46. Puerto Rico	24,000	26,510	39,612
47. Uruguay	38,500	41,000	37,230
48. South Korea	10,000	16,500e	35,000e
49. Israel	19,965	22,805	30,000
50. Morocco	—	—	9,000
51. Fed. of Rhodesia & Nyasaland	—	—	8,000
52. Central African Federation	7,000	7,500	8,000
53. Albania	—	8,000	8,000
54. Indonesia	7,000	6,700	7,000
55. Iran	2,866	4,400	5,580
56. Ceylon	242	4,696	5,000
57. North Korea	5,000	5,000	5,000
58. Ecuador	1,000	4,000	4,510
59. Thailand	4,000	2,847	3,500
60. Guatemala	900	2,200	2,800
61. Sudan	—	1,595	2,232
62. Libya	1,000	2,200	1,855
63. Lebanon	—	900	1,500
64. Congo Republic	—	650	585
65. Paraguay	450	450	450
66. Bolivia	800	283	435
67. Ghana	300	300	350
68. Ethiopia	237	237	325
69. Malaya	—	300	300
70. El Salvador	300	206	206
71. Dominican Republic	100	100	679
U.S. & Canada	39,932,603	42,635,470	42,899,267
Europe	21,678,351	25,542,051	28,257,072
Asia	4,979,373	6,777,087	7,862,715
Latin America	1,314,318	1,740,645	1,825,058
Oceania	537,819	729,195	801,930
Africa	160,537	272,492	316,784
Total World Production	68,603,001	77,696,940	81,962,826

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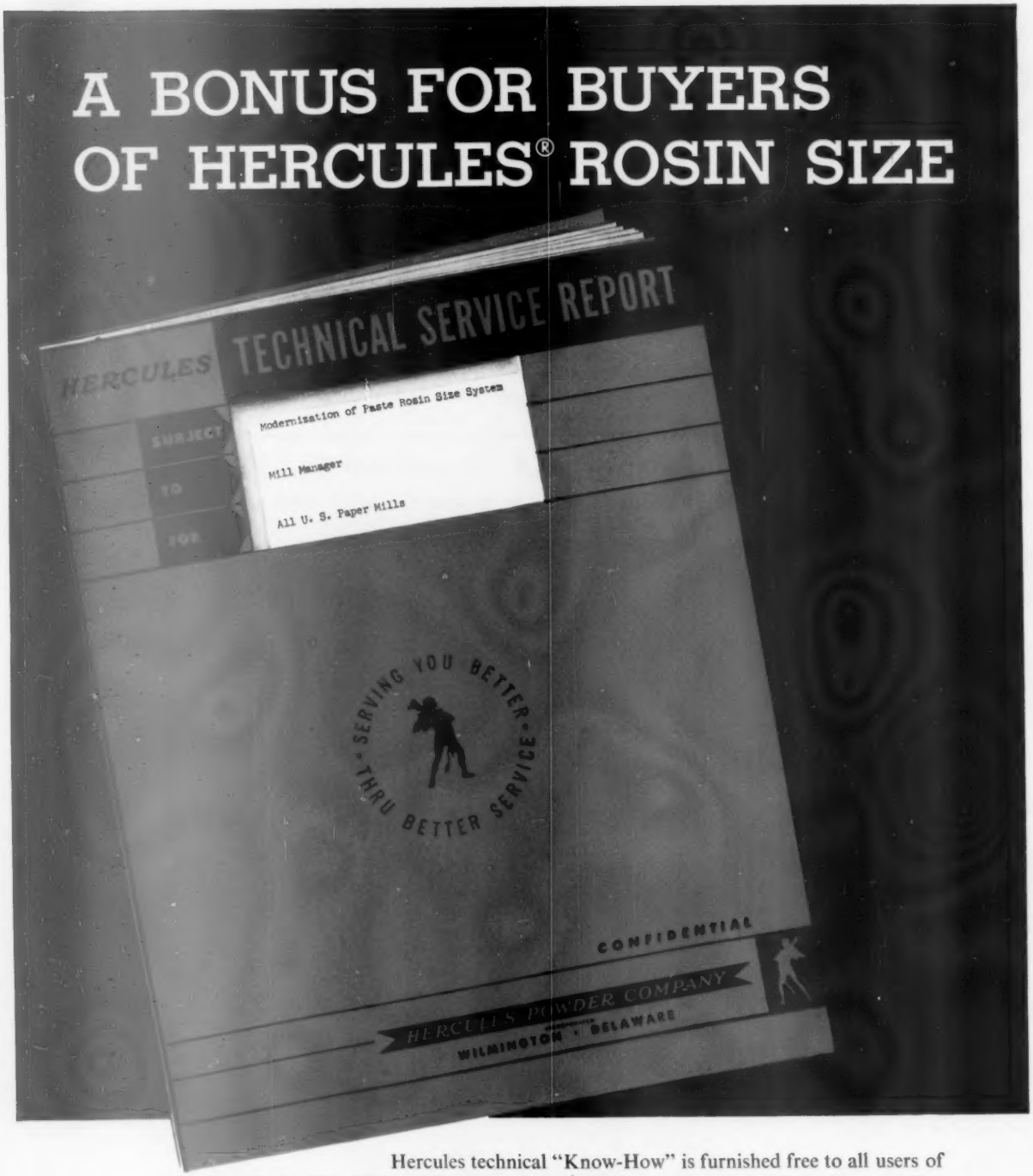

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Pine and Paper Chemicals Department

HERCULES POWDER COMPANY
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PP61-6

Total world paper production has been climbing steadily since this magazine began to gather these statistics from all the continents. Back in 1953, total world paper production was 52,332,881. In 1956, the figure was 55,082,488 short tons. Thus, in five years, world paper production has climbed 27 million tons.

In many of the less developed countries, only the estimates of expert observers were available to us. Not every country, even some of which are advanced in other ways, have official figures. But in the great majority of cases, these statistics are official, and the first to be tabulated on a worldwide basis for the year 1960.

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Interesting Facts about Pulp

The pulp statistics are interesting—and it must be remembered our figures include all kinds from wood to stalks and grasses. They show European production is substantially behind that of U.S.A. and Canada. The latter's combined production was 36,336,907 short tons in 1960 compared with 32,674,016 five years ago. Total European pulp production was 23,109,795 compared to 18,164,681 in 1956. These two continental areas are far ahead of all others.

The United States again, with 25,154,000 short tons of pulp production in 1960 (a gain of 3.2% over 1959), was far ahead of other nations. It made more than twice Canada's output of 11,182,907. Next, as our table shows, is Sweden, with 5,480,000, Finland with 4,071,000, Japan, with 3,893,000 and Russia with 3,567,960 short tons.

All other nations are more than 1,800,000 tons behind these "Big Six" of the pulp world. West Germany and Norway each make less than 1,800,000 tons and France is the only other nation making over 1,000,000 tons. The increasing uses of hardwoods, in America and Europe and elsewhere, may make important changes in these figures. Some years from now, it can be expected that the use of tall and fast growing reeds, bamboo, cereal straws and cane bagasse as well, perhaps, as some still unpopular woods in remote lands, will figure in these calculations in a far more prominent way. These possibilities are discussed in our World Pulp Section—not only possibilities but developments already taking place.

All Nations Producing Pulp and How They Rank

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Production of wood, straw, bagasse, esparto, bamboo and other pulps in short tons of 2000 lbs.

	1956 (Short Tons)	*1959 (Short Tons)*	*1960 (Short Tons)*
1. United States	22,131,000	24,257,000	25,154,000
2. Canada	10,543,016	10,643,281	11,182,907
3. Sweden	4,512,000	4,845,000	5,480,000
4. Finland	3,131,000	3,495,000	4,071,000
5. Japan	2,427,195	3,315,000	3,893,100
6. Russia	2,871,000	3,359,400	3,567,960
7. West Germany	1,437,535	1,647,537	1,717,955
8. Norway	1,378,142	1,523,258	1,669,265
9. France	886,800	1,195,300	1,365,300
10. China	600,000	780,000	850,000
11. East Germany	635,800	736,000	812,000
12. Czechoslovakia	530,000	685,839	760,818
13. Austria	631,238	654,229	699,453
14. Netherlands	191,000	564,300	601,128
15. Italy	461,303	541,503	595,583
16. Poland	420,530	465,200	505,400
17. Brazil	210,000	279,400	343,200
18. New Zealand	214,300	277,100	292,780
19. Mexico	174,000	225,000	260,000
20. Australia	208,379	217,600	240,800
21. Switzerland	209,000	218,007	226,799
22. Yugoslavia	134,023	177,200	192,500
23. Spain	147,400	172,000	180,000
24. Taiwan	22,510	143,699	173,861
25. Belgium	117,136	144,000	160,000
26. United Kingdom	148,684	150,000	150,000
27. Rumania	184,000	120,000	130,000
28. South Africa	85,000	111,000	128,075
29. Chile	22,488	105,154	114,704
30. Argentina	88,000	97,601	97,347
31. Portugal	52,522	76,560	95,000
32. India	57,120	72,800	90,000
33. Pakistan	31,360	36,527	62,134
34. Turkey	32,439	44,041	54,000
35. Hungary	25,000	47,986	48,744
36. Bulgaria	27,768	36,350	34,250
37. Puerto Rico	12,000	24,080	31,843
38. Cuba	20,000	27,000	25,000
39. Denmark	14,800	23,000	25,000
40. Peru	15,000	21,000	21,000
41. South Korea	6,900	7,700	11,000
42. Ireland (Eire)	10,000	10,640	10,640
43. Uruguay	7,700	8,500	8,800
44. Greece	8,000	8,000	8,000
45. Philippines	5,000	7,200	7,200
46. United Arab Republic	3,000	4,000	5,000
47. Indonesia	—	4,800	5,000
48. Fed. of Rhodesia & Nyasaland	—	3,000	4,000
49. Albania	—	3,000	3,000
50. Thailand	—	2,417	2,750
51. Ceylon	—	1,217	1,500
52. Guatemala	900	1,540	1,400
53. Ecuador	500	3,600	1,210
54. Bolivia	—	238	435
55. Malaya	—	150	150
U. S. & Canada	32,674,016	34,900,281	36,336,907
Europe	18,164,681	20,899,309	23,109,795
Asia	3,177,524	4,408,351	5,143,495
Latin America	550,588	793,113	904,939
Oceania	427,679	501,900	540,780
Africa	88,000	118,000	137,075
Total World Production	55,082,488	61,620,954	66,172,991

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THIS IS THE ONE COMPACT REGULATOR THAT OFFERS ALL THE ADVANTAGES OF DeZURIK'S MOTOR-DRIVEN SENSING ELEMENT! Through millions of hours of use, the DeZurik rotating sensor has clearly demonstrated its freedom from fouling and from stock hang-up. Even the stringiest stock is controlled accurately without the plug-ups occuring on stationary feelers. No shut-downs, practically no maintenance.

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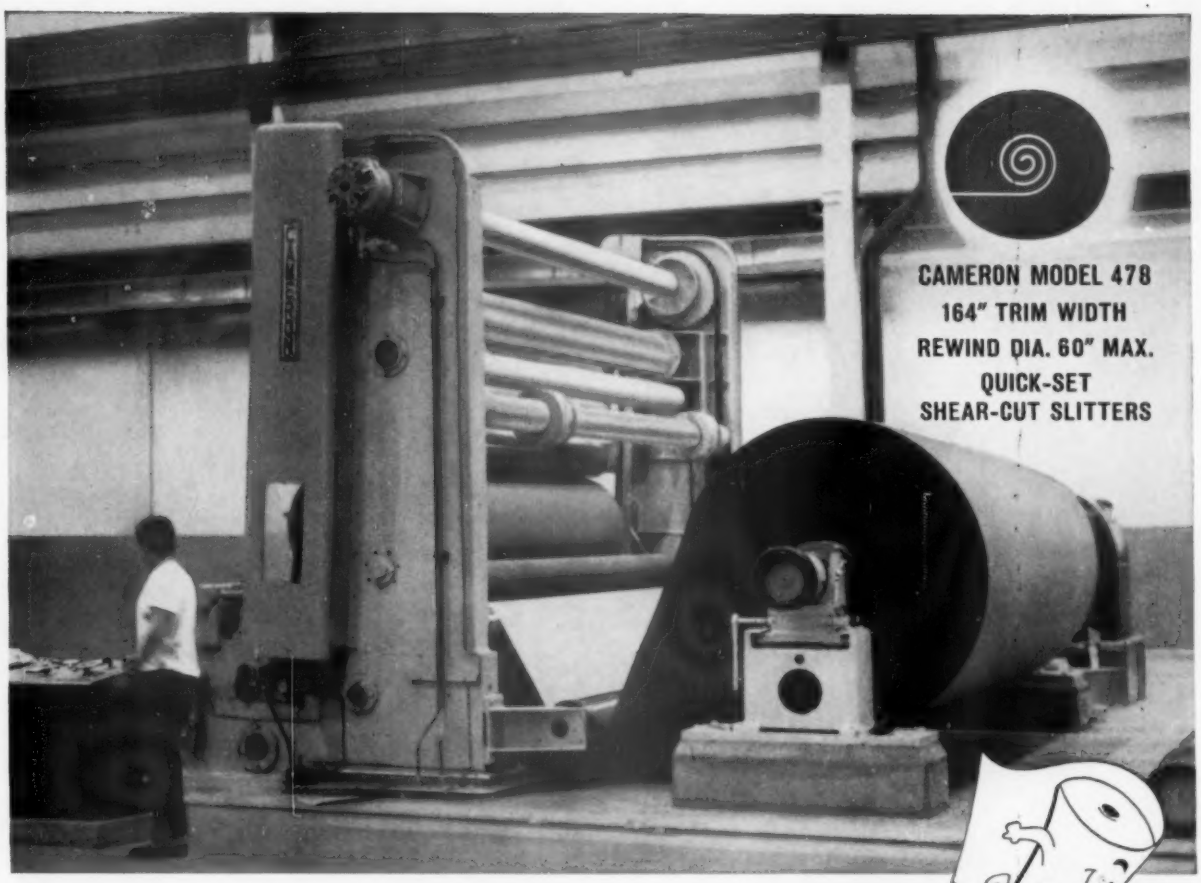

Georgia-Pacific *delivers* the superb running qualities of The New Roll

One good reason why the Georgia-Pacific Paper Company has experienced such rapid growth as a kraft producer for West Coast and export markets is found in the superb running quality of the rolls shipped from the No. 2 machine at the company's Toledo, Oregon mill. Kraft papers and board up to 33 lb. basis weight are delivered in rolls made with extreme care to assure maximum trouble-free yield in high speed printing and converting operations. Also integrated roll control keeps the web *alive* for better end results, not stretched out *dead* in the rolls.

These fine Georgia-Pacific rolls are produced on a Cameron 478 unwinding-slitting-rewinding system, integrated and job-fitted by Cameron specialists for optimum unwind-to-rewind roll control. The heart of this Cameron 478 installation is a regenerative electrical unwind braking system which teams the main winder drive and an unwind braking generator under electronic amplifier controls to provide highly sensitive, continuous response to variations in web tension.

Among other roll control elements of the Cameron 478 are the isolated main drive gear box, down-pressure riding roll brakes, and cam-controlled, tapered automatic counterweighting. All roll control elements are adjustable to the characteristics of the paper or board to be run, the quality of the parent rolls, and the intended service of the finished rolls. The result is a fundamentally different kind of finished roll—a custom-made roll of superb running quality. We call it The New Roll.

Cameron specialists offer a unique test-run service to help you achieve the fine running qualities of The New Roll. In the Cameron Research & Development Service in Dover, N. J., test-runs are being made on all types of papers and board on integrated pilot systems which simulate actual job conditions. Here you can see, before you buy, either an improvement element, such as a new unwind brake and tension system, or a complete, integrated roll production system, engineered to give you The New Roll. Let's plan an early date for *your* test-runs. Write for details.

CAMERON

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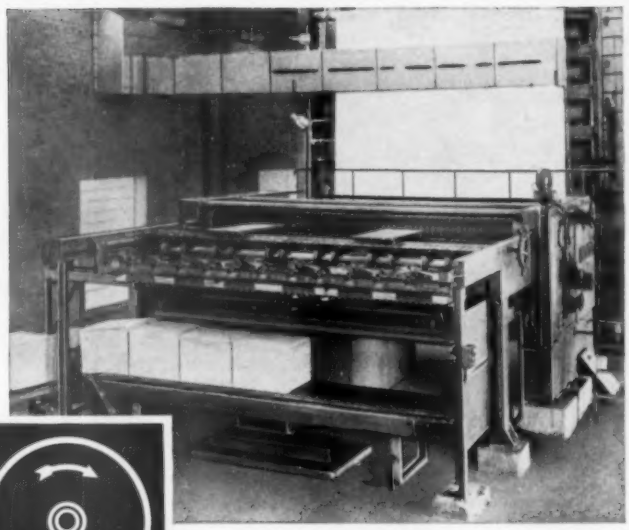
ROTARY PULP CUTTERS

"Synchro-Fly" shear cut system



Special Features

Knife Capacity: 600 lbs M SQFT and more

Output: 250 tons/24 hours and more

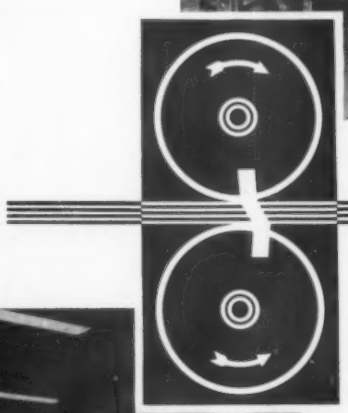
Web Width: 170" and wider

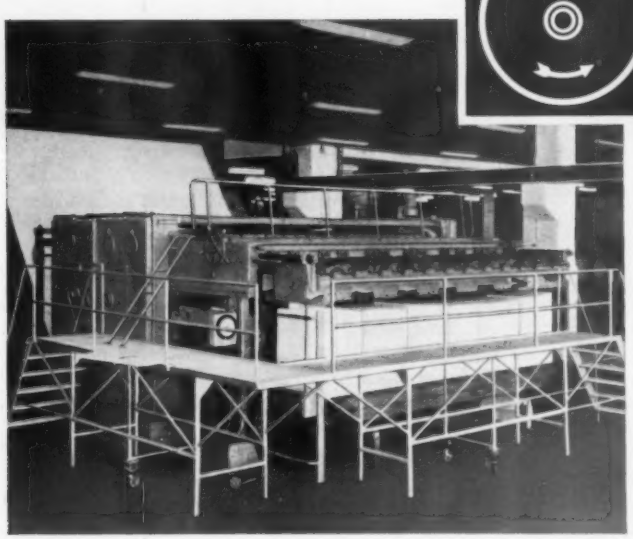
Wet Lap Pulp: 45% o.d. and less

Unusual Knife Life. (Knives have stayed in the machine for 36 months under continuous operation).

Pushbutton switch from standard size to wrapper size.

One-man operation of entire installation including conveyor and scale.





Automatic right angle cut for all sizes without adjustments.

No compression of cut edges. This is of particular importance for rayon pulp.

Semi- and fully automatic installation, cutting from rolls or in-line with pulp dryer.

Layboys to connect with baling presses and conveyors.

A JAGENBERG Contribution to Operating Economy
80 Years of Experience at your disposal

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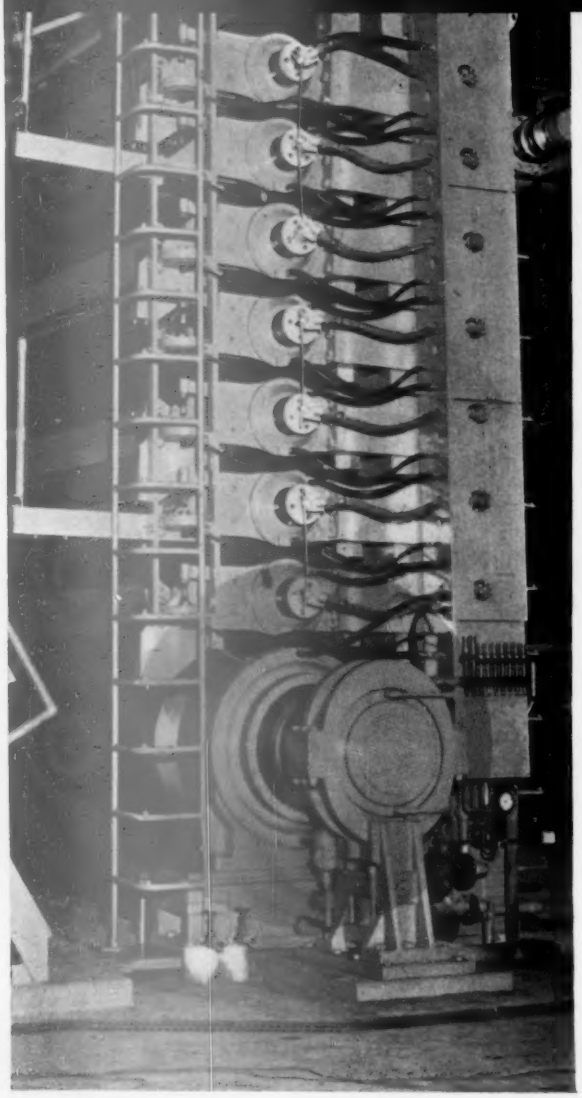
Here's How the **ACCRA-NIP*** *calender roll bending control reduces operating costs*

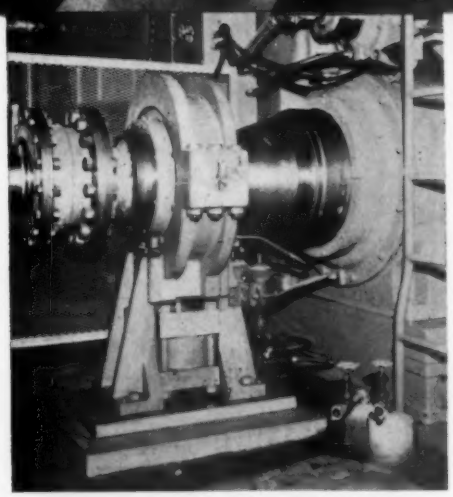


You Get a Uniform Sheet on Every Grade Change WITHOUT REGRINDING CROWNS

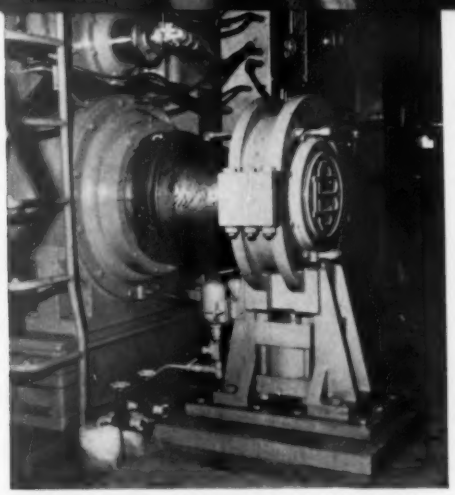
*This significant new Black-Clawson design concept can help reduce the profit squeeze in many a paper mill. The ingenious Accra-Nip bottom roll bending device varies the crown automatically to suit grade change operating conditions. Here are the cost-cutting advantages.

- No regrinding of roll crown when changing number of nips or loading.
- Only one bottom roll crown.
- Crown corrections made at console while calender is running.
- All corrections made at one place . . . the bottom nip.

* Trade Mark



Drive side load cylinder and bearing

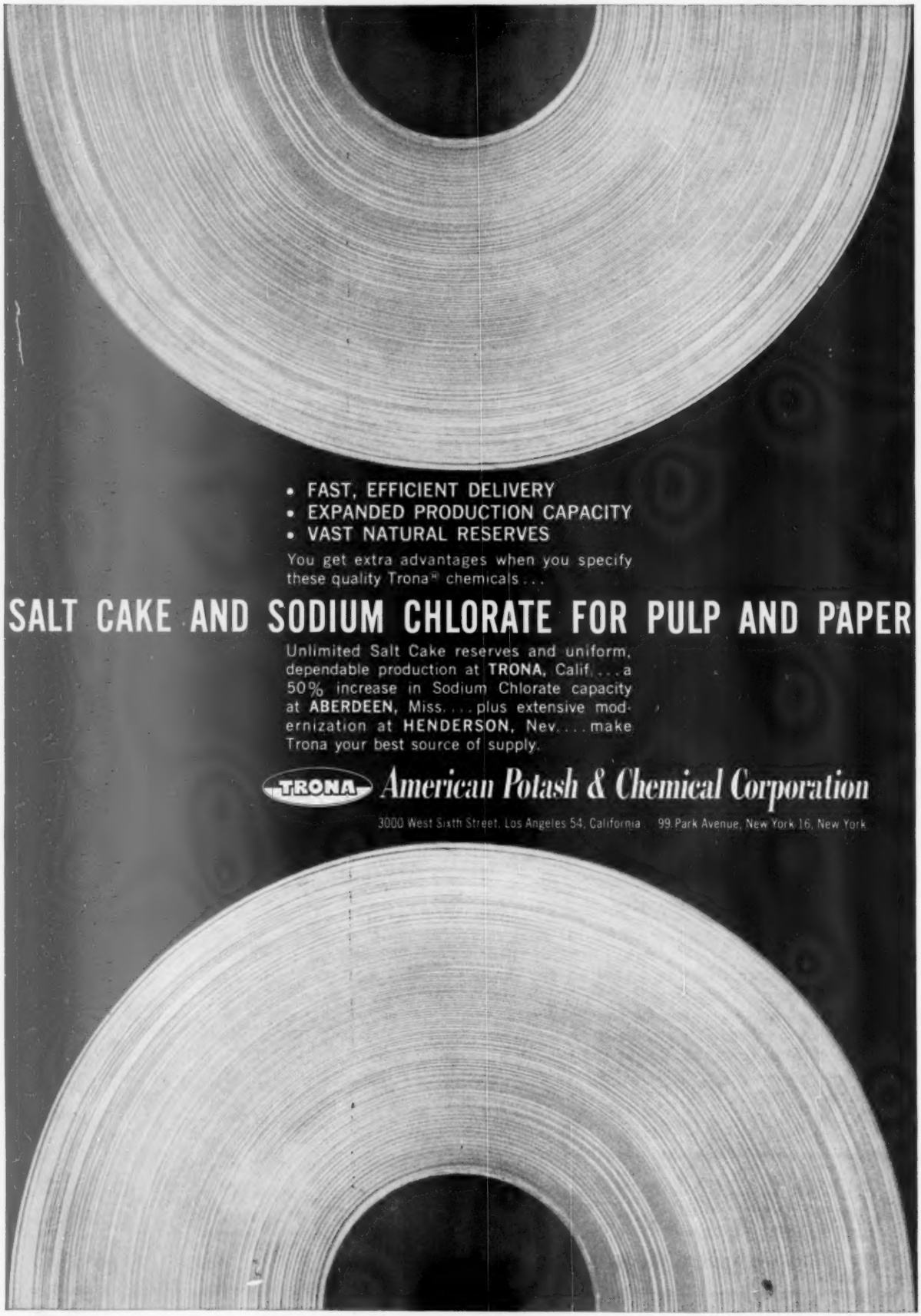


Load cylinder and bearing . . . tending side

Here's How it Works — Bottom roll journals are extended beyond main roll bearings. A load bearing is mounted on each journal outside the main roll bearing and connected to floor mounted hydraulic cylinders. Individually controlled, they load the journals *up* or *down* thereby changing the amount of crown across the top of the roll. Get all the facts on this important new development and learn how Accra-Nip control can reduce your operating costs. Contact The Black-Clawson Company Paper Machine Division, Watertown, N. Y., today.

PAPER MACHINE DIVISION
Watertown, New York
ANOTHER ADVANCED ENGINEERING DESIGN

BLACK-CLAWSON


• FAST, EFFICIENT DELIVERY
• EXPANDED PRODUCTION CAPACITY
• VAST NATURAL RESERVES
You get extra advantages when you specify these quality Trona® chemicals . . .
SALT CAKE AND SODIUM CHLORATE FOR PULP AND PAPER
Unlimited Salt Cake reserves and uniform, dependable production at TRONA, Calif. . . . a 50% increase in Sodium Chlorate capacity at ABERDEEN, Miss. . . . plus extensive modernization at HENDERSON, Nev. . . . make Trona your best source of supply.
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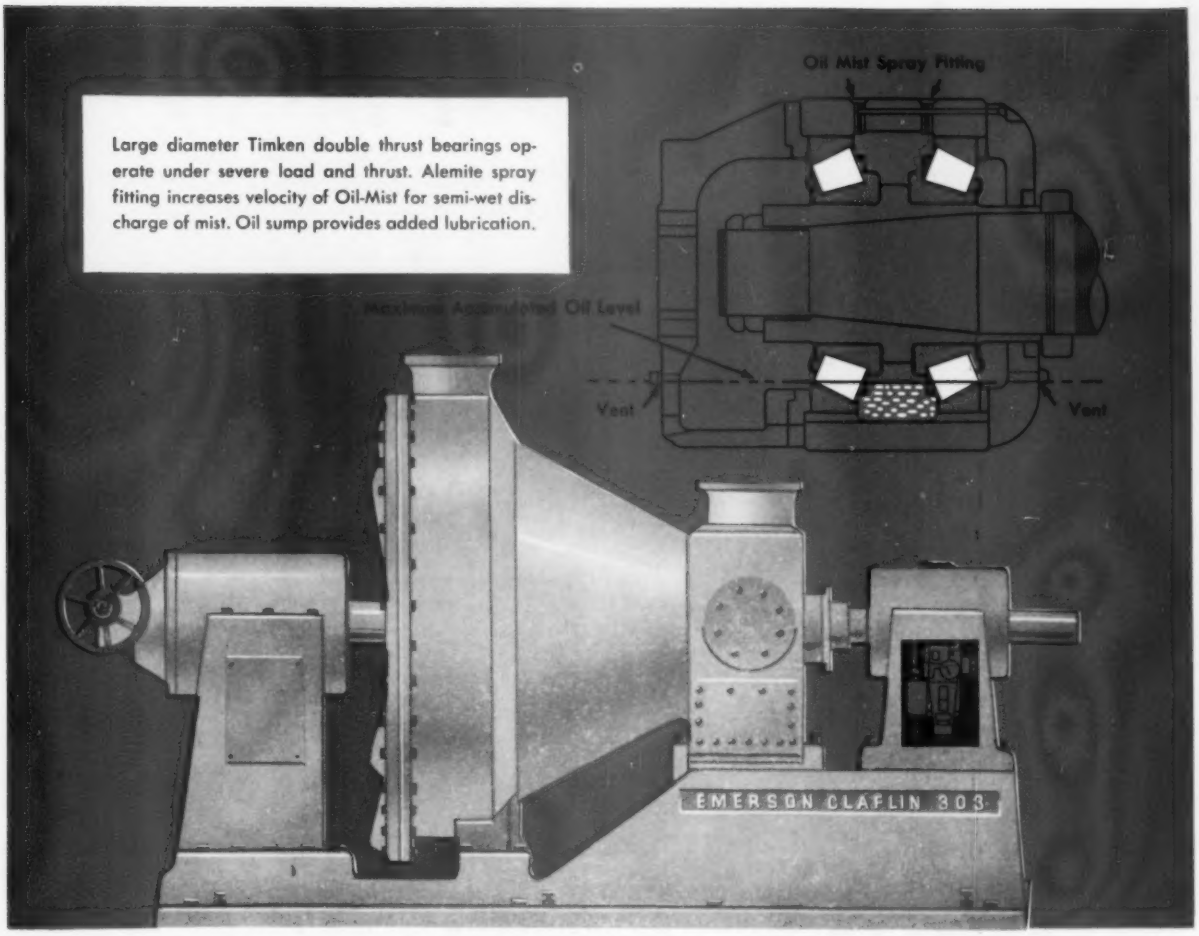

Large diameter Timken double thrust bearings operate under severe load and thrust. Alemite spray fitting increases velocity of Oil-Mist for semi-wet discharge of mist. Oil sump provides added lubrication.
Oil Mist Spray Fitting
Maximum Accumulated Oil Level
Vent
Vent
EMERSON CLAFLIN 303

ADVANCED DESIGN OF EMERSON CLAFLIN 303 CALLS FOR ALEMITE OIL-MIST SYSTEM!

Built-in system provides continuous automatic lubrication for two double Timken thrust bearings with shaft diameters of 5.25" and 6.628"

Right at the planning stage, Emerson Manufacturing made sure that its new, multi-purpose Model 303 Refiner would offer outstanding built-in lubrication advantages. This leading supplier of refining equipment designed an Alemite Oil-Mist System into its new refiner!

Alemite Oil-Mist is fully automatic. Constant flow of Oil-Mist through the bearings keeps dirt out, protects surfaces against abrasive particles. The 303 continues to operate while it is being lubricated – there is no lubrication down-time. 100% of the oil placed in the reservoir is delivered to the bearings. There is no waste.

Net result: longer bearing life, elimination of lubrication down-time, and as much as 90% less oil consumption for 303 owners!

Designed for a wide range of applications. Oil-Mist provides constant, uniform lubrication of many sizes and types of bearings, gears, chains, slides and ways. Oil-Mist can be installed by the machinery manufacturer or by the user. Check your plant. Perhaps you, too, can benefit from many important Oil Mist advantages.

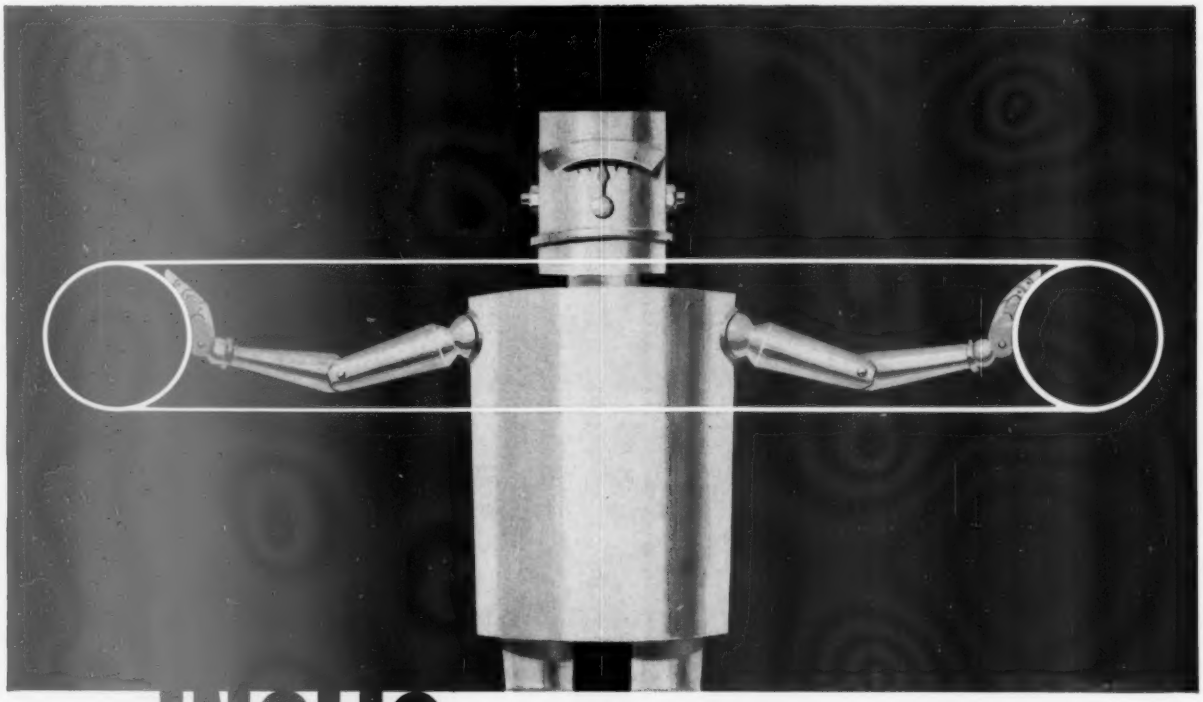
Write today for free Oil-Mist catalog!

Symbol of SW Excellence

ALEMITE DIVISION **STEWART-WARNER** CORPORATION

Dept. U-71 1850 Diversey Pkwy., Chicago 14, Ill.

Newest improvement in paper making!



INGLIS WIRE TENSION DEVICE

. . . lengthens wire life through automatic control

The newest Inglis contribution to better paper making takes the business of wire tension adjustment out of human hands—maintains the appropriate uniform tension automatically. The device lengthens wire life by compensating automatically for natural stretch, and by positively eliminating the danger of damage from overtension in a wire cooling after hot stock is removed. When required, easy manual changes can be made, allowing the paper maker to use his judgment in selecting the best tension for different wires. Tension settings may be recorded for later reference.

From head box to winder, paper machinery by Inglis is designed and built to keep the modern paper maker in step with modern production demands.

For full details of the Inglis Wire Tension Device, write for publication P.P. 604.

Inglis

PAPER MAKING MACHINERY

JOHN INGLIS CO. LIMITED

14 STRACHAN AVENUE, TORONTO, CANADA

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Sales and Service throughout Canada and the U.S.A.

YARWAY news briefs

from **Yarnall-Waring Company,** *Philadelphia 18, Pa.*

BRANCH OFFICES IN 19 UNITED STATES CITIES • SALES REPRESENTATIVES THROUGHOUT THE WORLD

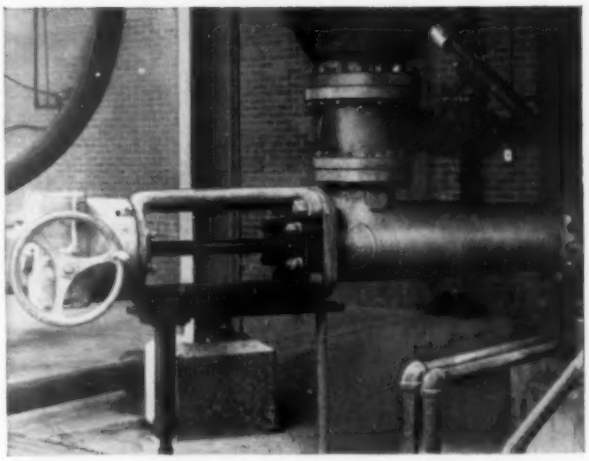
HOW TO RAISE PULP PRODUCTION... AND LOWER DIGESTER OPERATING COSTS

YARWAY DIGESTER BLOW VALVES have demonstrated in scores of mills how they can improve the profit picture *two ways*—by *raising production* and *lowering costs.*

Yarway's famous seatless sliding plunger design *provides up to 100% greater discharge area* over many other digester valves of same nominal pipe size. This gives

1. FASTER DISCHARGE
2. REDUCED BLOWING TIME
3. LOWER PRESSURE DROP

Coupled with CLEANER BLOW and TIGHTER SEAL, it all adds up to MORE COOKS PER DAY, GREATER OUTPUT OF PULP.

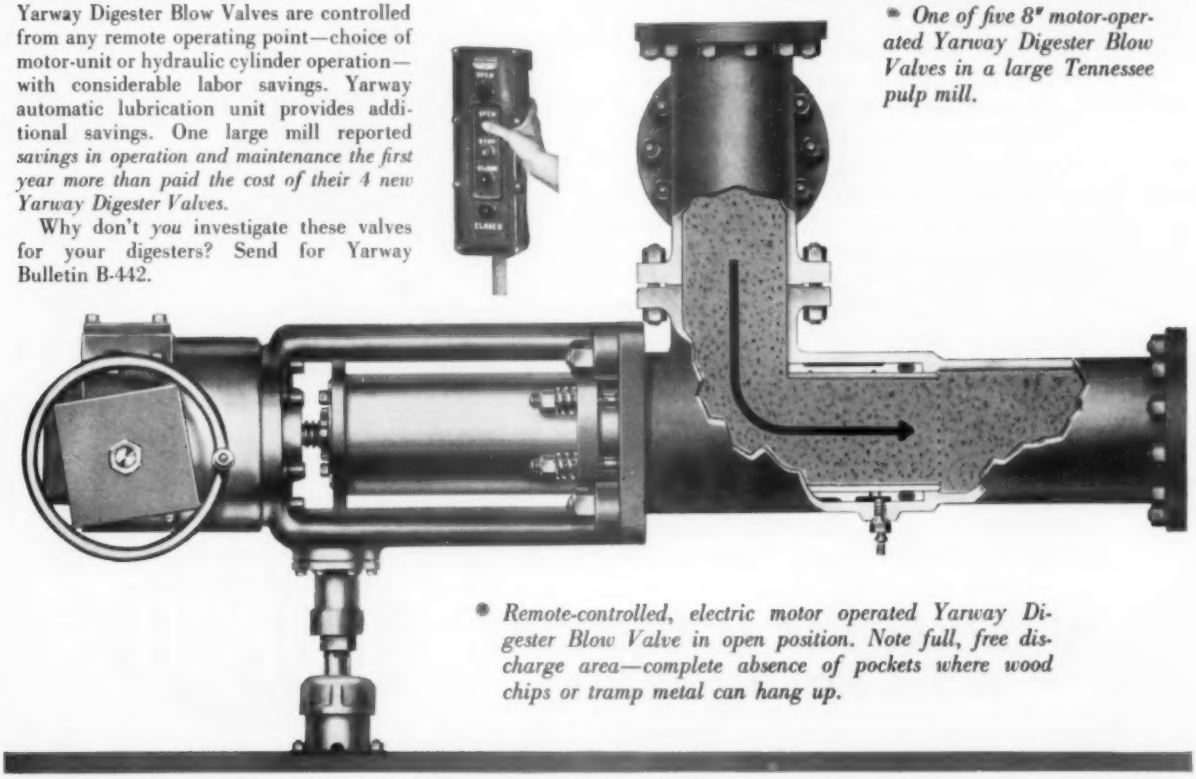


• *One of five 8" motor-operated Yarway Digester Blow Valves in a large Tennessee pulp mill.*

REMOTE CONTROL

Yarway Digester Blow Valves are controlled from any remote operating point—choice of motor-unit or hydraulic cylinder operation—with considerable labor savings. Yarway automatic lubrication unit provides additional savings. One large mill reported *savings in operation and maintenance the first year more than paid the cost of their 4 new Yarway Digester Valves.*

Why don't *you* investigate these valves for your digesters? Send for Yarway Bulletin B-442.



• *Remote-controlled, electric motor operated Yarway Digester Blow Valve in open position. Note full, free discharge area—complete absence of pockets where wood chips or tramp metal can hang up.*

A SKILLED HAND IN CHEMISTRY...AT WORK FOR YOU

SEEKING IMPROVED PAPERS?

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Nopco points the way to quality products in pulp and paper operations. Nopco offers a full line of paper chemicals, each specifically designed to yield better products . . . every time . . . with dependability you can count on.

Perhaps the skilled hand of Nopco can go to work for you. Back of every chemical made by Nopco for the paper industry stands Nopco Technical Service—an experienced staff ready to assist with laboratory data and recommendations based upon your specific requirements.

DEFOAMERS	FELT WASHING DETERGENTS
WAX SIZES	CALENDER STACK LUBRICANTS
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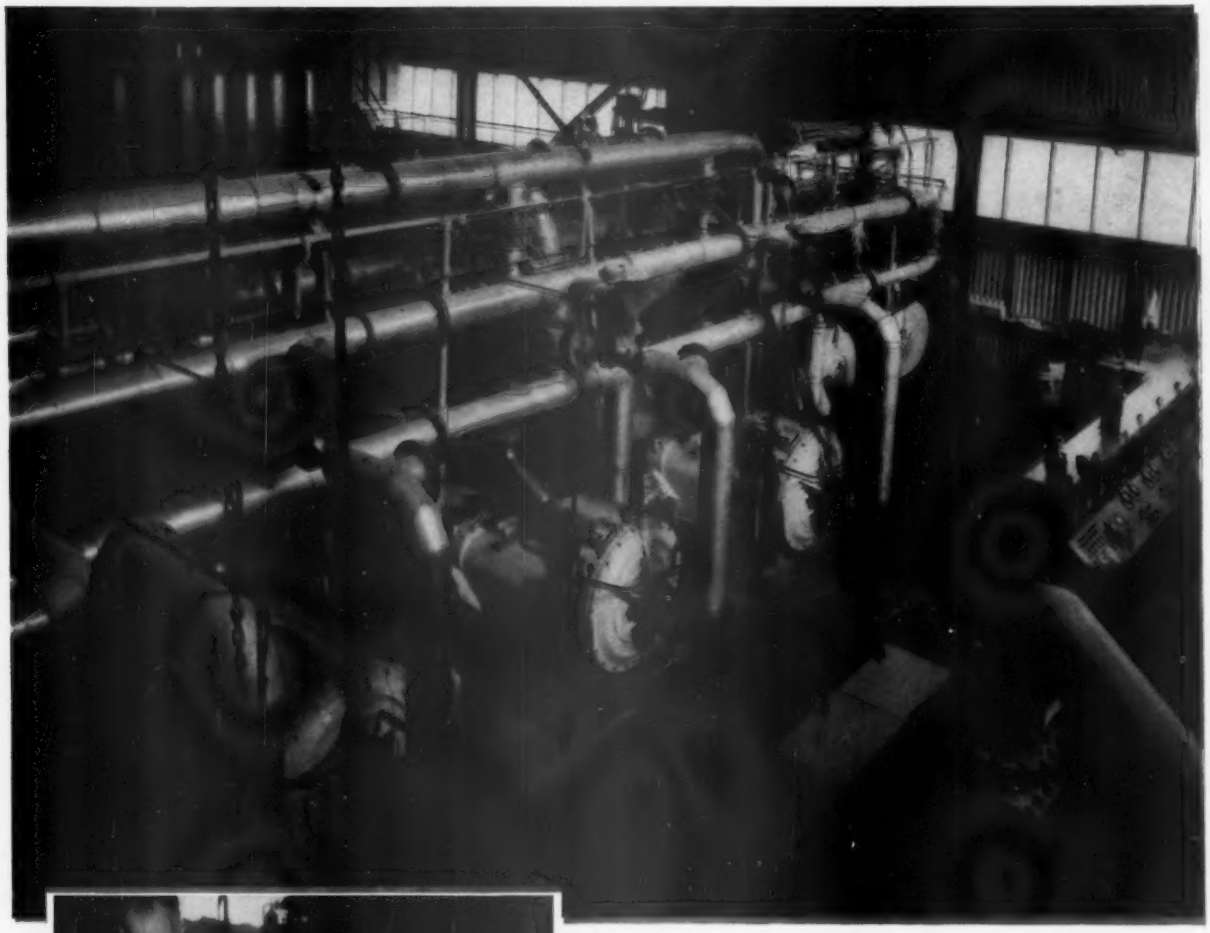
23 YEAR DISC LIFE INDICATED



After two years of tough work Jones Double-D Super-Stainless discs show only .065" wear — evenly distributed and with parallelism perfectly retained.

for Jones Double-D's on the Seminole Chief

Sept. 7, 1957 was the day St. Regis began to produce their fine quality Seminole Chief Board in Jacksonville — with the help of ten Jones Double-D's for both primary and secondary refining. Regular six month checks of the Jones Super Stainless discs in each Double-D show a maximum wear of only .0027" per month. Applied against the available disc wear of .750", this actually indicates a disc life of more than 23 years!

This fine record has been made, too, under heavy power requirements — normally more than 600 HP and sometimes running as high as 1000 HP on each primary refiner for periods of several weeks!

Have a tough refining problem? Better look into the Jones Double-D. Write to E. D. Jones Corporation, Pittsfield, Mass., for bulletin EDJ1083.

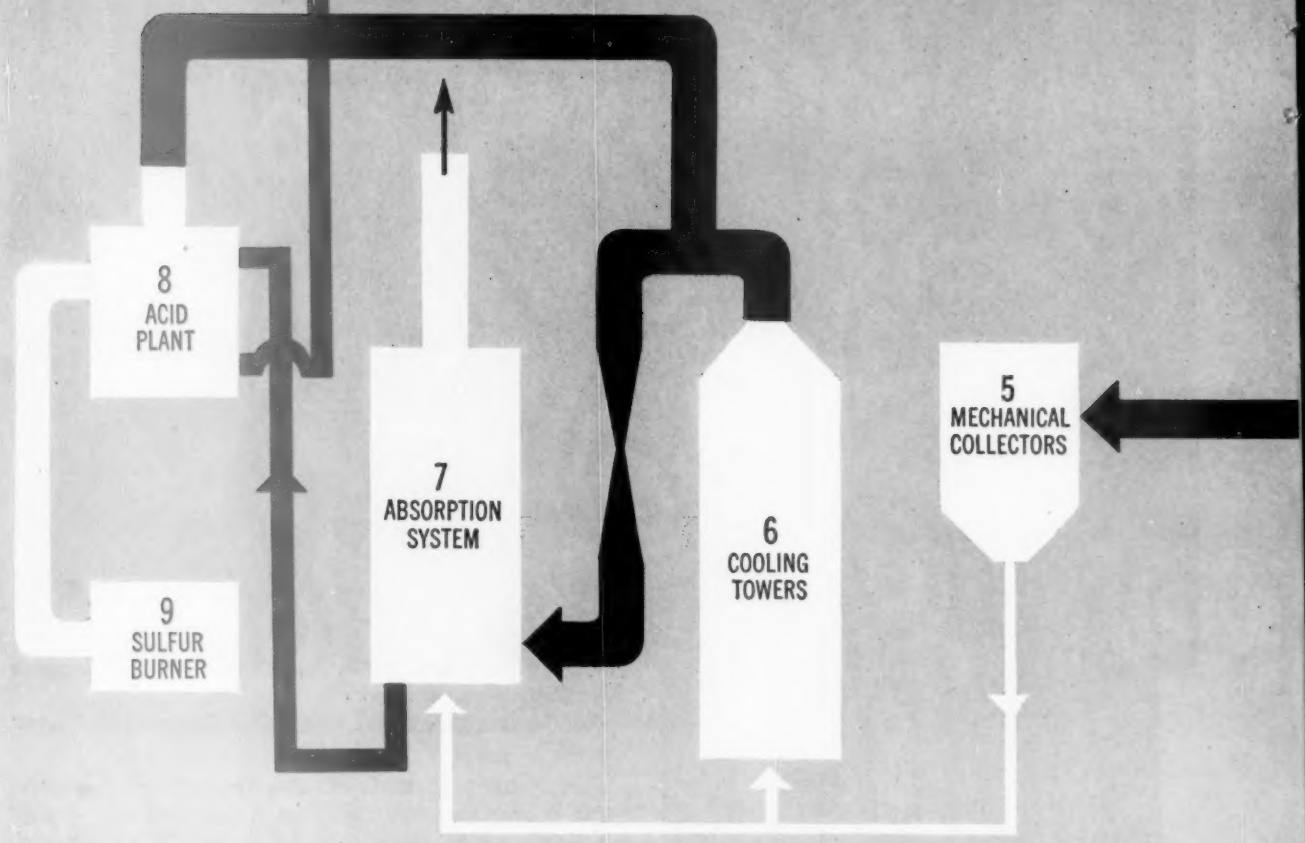
E. D. JONES CORP. member BELOIT group PITTSFIELD, MASS.

Jones

PULP MILL EQUIPMENT AND STOCK PREPARATION MACHINERY

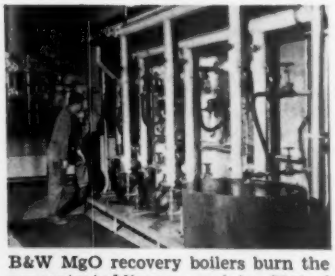
Represented in Canada by
The Alexander Fleck Ltd.
75 Spencer Street, Ottawa

MgO pulping and recovery process. Pulp wood chips are digested in magnesium bisulfite liquor (1) pulp is withdrawn and washed (2) and knots removed. Liquor with 10 to 15% solids is passed through multiple-effect evaporators (3) to raise the solids content to 55% before burning in recovery boilers (4) to produce steam at 860 psi and 825 F for power generation and processing. MgO and SO_2 are released from the liquor during the incineration process. MgO is recovered in mechanical collectors (5) while the SO_2 and flue gases pass to the cooling and absorption towers (6). Recovered MgO is hydrated and introduced into the acid circulating to the absorption system (7). Here it combines with SO_2 to form magnesium bisulfite acid. The cycle is completed by fortifying the recovered magnesium bisulfite acid (8) with sulfur dioxide from the sulfur burner (9).



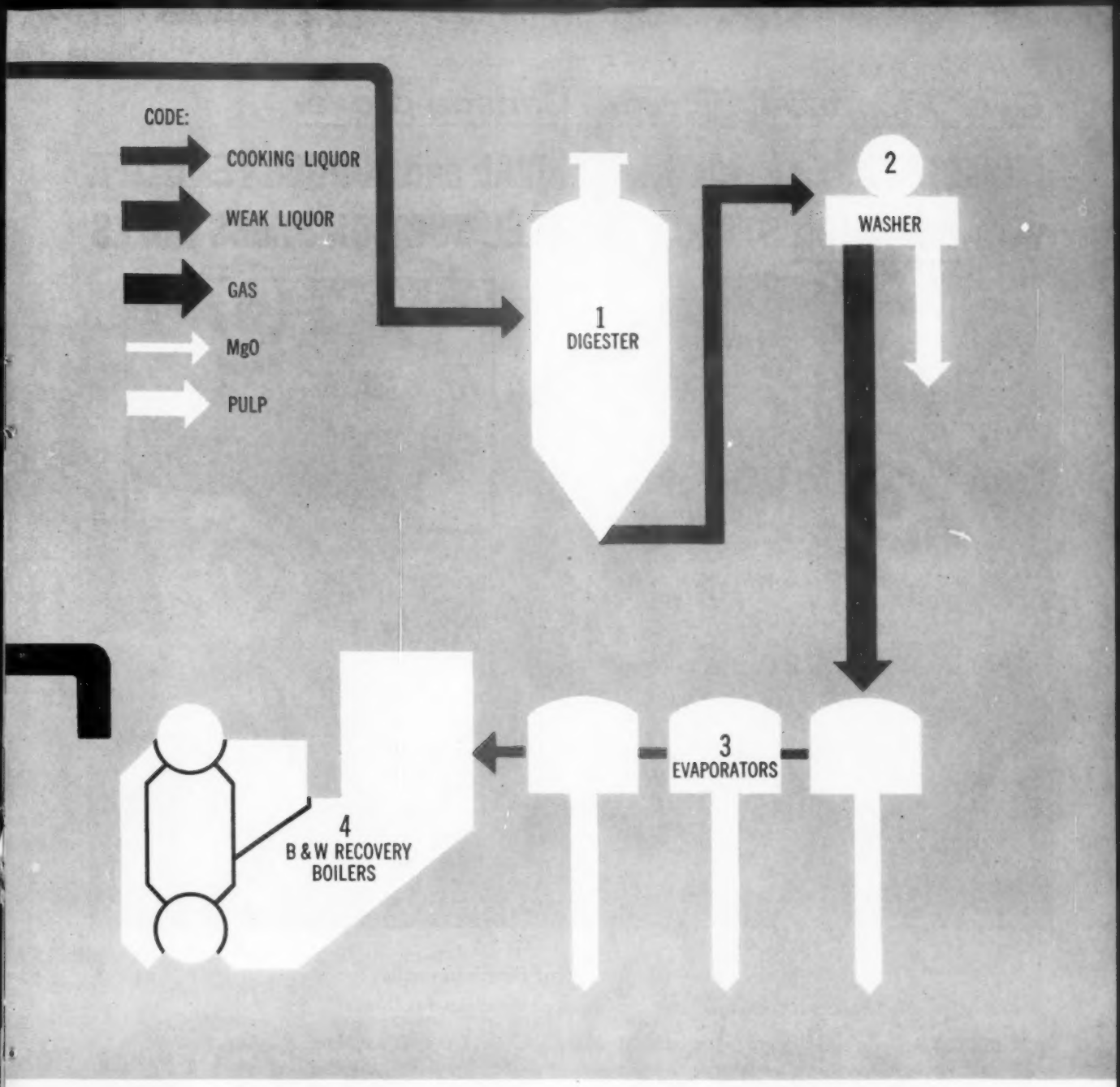
MgO process at Weyerhaeuser's Cosmopolis

Evaporators in series increase pulping liquor from less than 15% to about 55% solids to permit its burning.



B&W MgO recovery boilers burn the concentrated liquor, supplying 70% of the plant's steam requirements.

Mechanical collector reclaims MgO from furnace flue gas and washes it before further use.



Mill recovers 90% of spent liquor solids

Only 20 pounds of magnesium oxide and 40 pounds of sulfur per ton of unbleached pulp are needed for make-up at Weyerhaeuser Company's 400 ton per day sulfite mill at Cosmopolis, Washington.

The simple, closed cycle MgO pulping and recovery process, placed in operation during 1957, reclaims about 90% of the pulping chemicals. The B&W MgO recovery boilers provide 70% of the steam required for the entire plant's power generation and processing needs. A third B&W bark and oil fired boiler provides the balance of steam requirements.

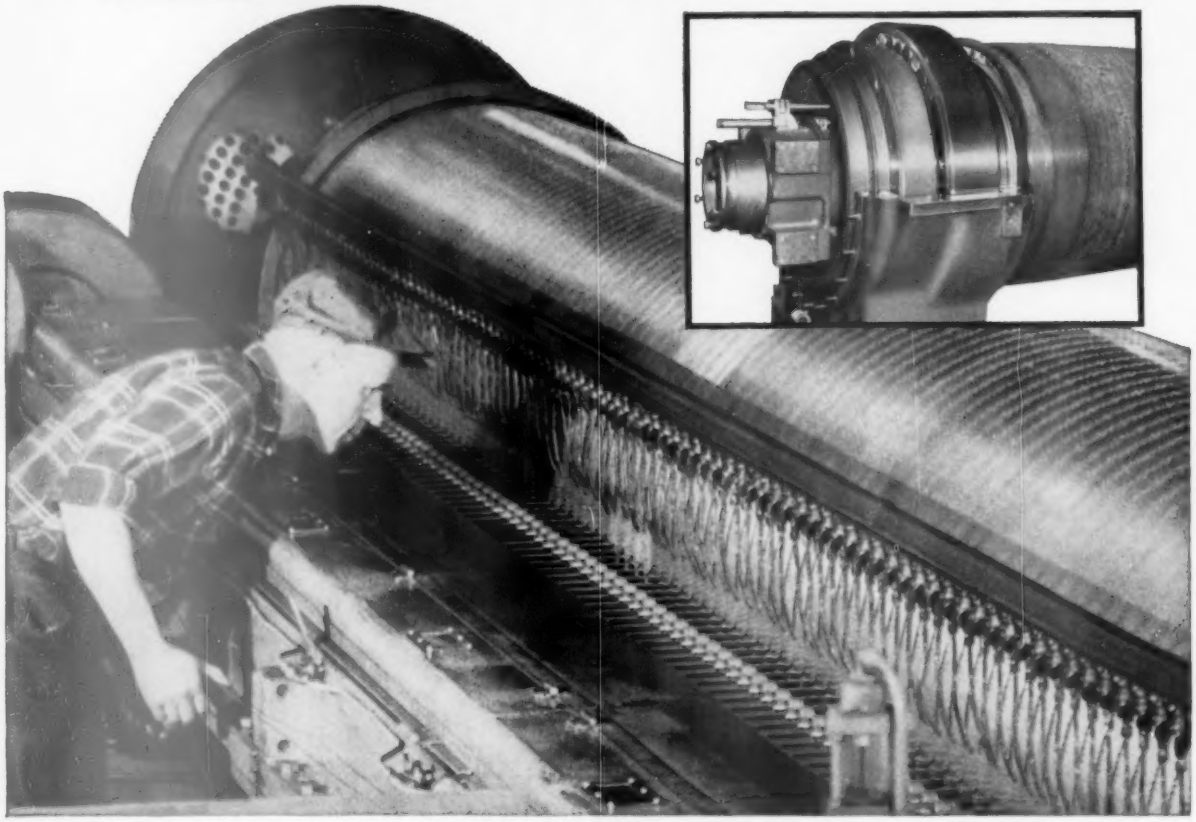
The commercially-proven MgO pulping and recovery process is ideal for either new mills or conversion and modernization of existing mills. Shorter cooking time required for MgO pulping cuts capital and maintenance costs in new installations and permits increasing the production of existing mills. Quality sulfite pulp with high brightness and strength is produced.

For more information about the efficient MgO pulping and recovery process, contact your nearest B&W sales office or write The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio. E-302-1001

Babcock & Wilcox

Over 100 installations in Canada prove:

MORE EFFICIENT WATER REMOVAL and LONGER FELT LIFE with DOMINION STAINLESS STEEL SUCTION PRESS ROLLS



This proven operating superiority of Dominion rolls is the result of these design and construction features:

DESIGN

★ Open-end design for maximum accessibility and easy inspection.

★ Air-loaded suction box tops to ensure uniform wear of deckles and minimum adjustment.

★ Silent drilling pattern for quieter operation.

CONSTRUCTION

★ Forged stainless steel shell for maximum strength, to permit higher line pressures and ensure longer felt life.

★ Suction connection located either front or rear; easy removal of suction boxes without removing head.

★ Large anti-friction bearings for long life, low maintenance.

★ Adjustable suction box widths.

Dominion Suction Couch Rolls offer all the features listed here. They are normally supplied with a centrifugally cast bronze shell; in certain cases, stainless steel is used to overcome corrosion problems.

FOR FULL DETAILS, PLEASE CONTACT
PAPER DIVISION

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COMPANY LIMITED

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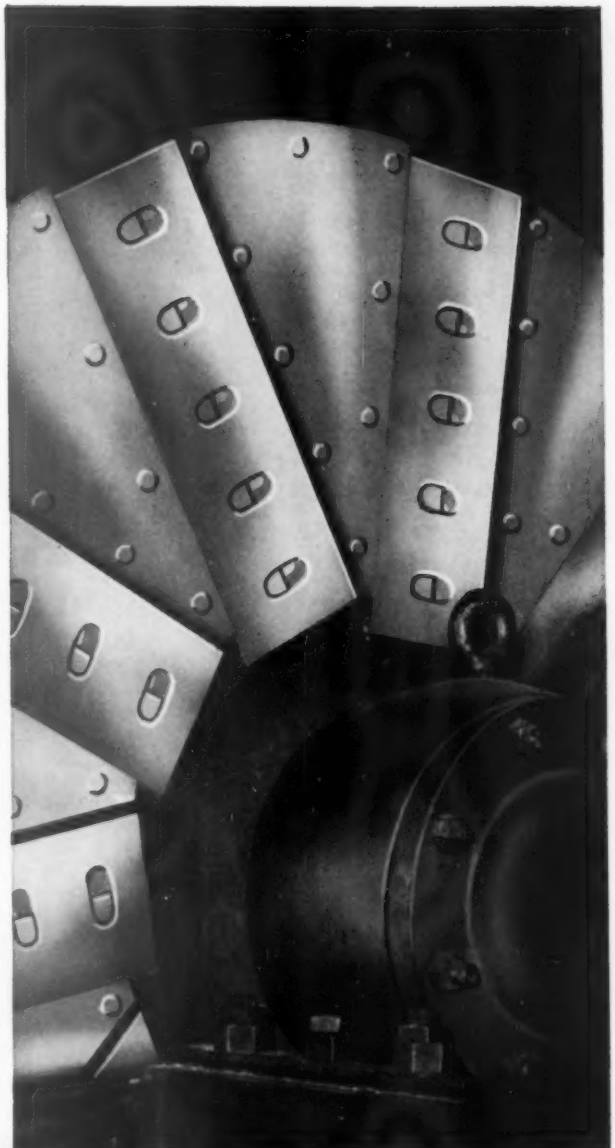
! the most wanted chipper knife in the U.S.A. or ABROAD

here's why:

OK VANCHROME steel is used exclusively in Battle Axe chipper knives. This superb American steel, developed by our metallurgists is super hard, yet extremely tough. It is a highly controlled analysis steel, assuring maximum uniformity, a trait not found in cheaper knives.

OK Battle Axe knives have been exhaustingly tested for the last two years in over 30 large mills. In all cases they ran approximately 15% to 25% longer between grinds than previously used knives.

The demand for these knives has required us to carry them in stock for our customers. Many sizes are now stocked in Cincinnati, Ohio and Portland, Oregon. You are assured rapid delivery plus personal service from the Ohio Knife Co. field service man in your area.



OK Battle Axe knives and wear plates on Murco Chipper, Halifax Paper Co.

VANCHROME STEEL

OK® BATTLE AXE

For complete information write—Chipper Knives Dept. 126-F

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Manufacturers of OK HOG KNIVES, VENEER KNIVES, CHIPPER KNIVES, PLANER KNIVES

Mathieson takes costs out of caustic deliveries

A major cause of high shipping costs is the distance between your plant and your supplier. When your caustic soda is marked Mathieson, you can count on fast, economical delivery from one of eight producing plants and shipping points (with a ninth under construction) covering the industrial East.

Other ways Mathieson lowers delivery costs? Only Mathieson ships 73% caustic by truck for fewer trips, less weight on shorter hauls. Only Mathieson schedules truck shipments so you get caustic when you need it.

And, of course, Mathieson service backs every order with technical assistance—on the spot or in our laboratories. Call or write OLIN MATHIESON, Baltimore 3, Md.

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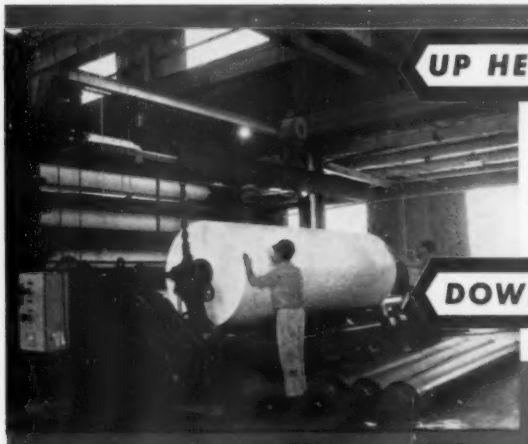


UP HERE, there's a **EUCLID CRANE**

Placing Cores on the Paper Winder

DOWN HERE

This essential paper mill operation is made easier and accomplished quicker with the aid of a precision control Euclid Crane.

Directly behind the large sheet roll of paper are three more cores ready for placement on the winder.

Paper mill cranes are a specialty of ours. We can build them to meet your general or specific handling needs. For stand-by or continuous service. Any capacity, any control system.

That's why an ever increasing number of paper mills are specifying EUCLIDS.

We've helped build our reputation through close cooperation with production supervisors and engineers in the paper industry.

Shown here is a 30 ton, 5 motor, double box girder Euclid crane in operation at a large southern roll reconditioning plant.

It is floor controlled for convenient operation and incorporates two independently operated trolleys. We'll be glad to discuss your crane or hoist requirements with you.

for details write

THE EUCLID CRANE & HOIST CO.

1363 CHARDON ROAD • CLEVELAND 17, OHIO

You've never seen a Combination like this*....

for Paper Machine Dryers

SUPER TYPE L-N

JOHNSON JOINT

with "Quick Release" Nipple

Best Design Yet for getting steam into dryer rolls with rotating syphon pipes. Needs no lubrication or adjustment. Has only a few simple parts—less chance of trouble plus easier field servicing. Assembly plate provides ready access to syphon pipe.

Floating Action—Rod supports carry all the real weight, let the rotating assembly "float" freely inside. Adaptable for machine with open or enclosed gearing.

SUPER Construction . . . *and Stamina* — Teams rock hard "Green Streak" seal rings with special Ni-Chrome plating, slashes friction load and increases service life.

Easy on . . . and off — "Quick Release" nipple uses powerful wedging action to lock joint in place. Install it—or remove it—with just an end wrench.

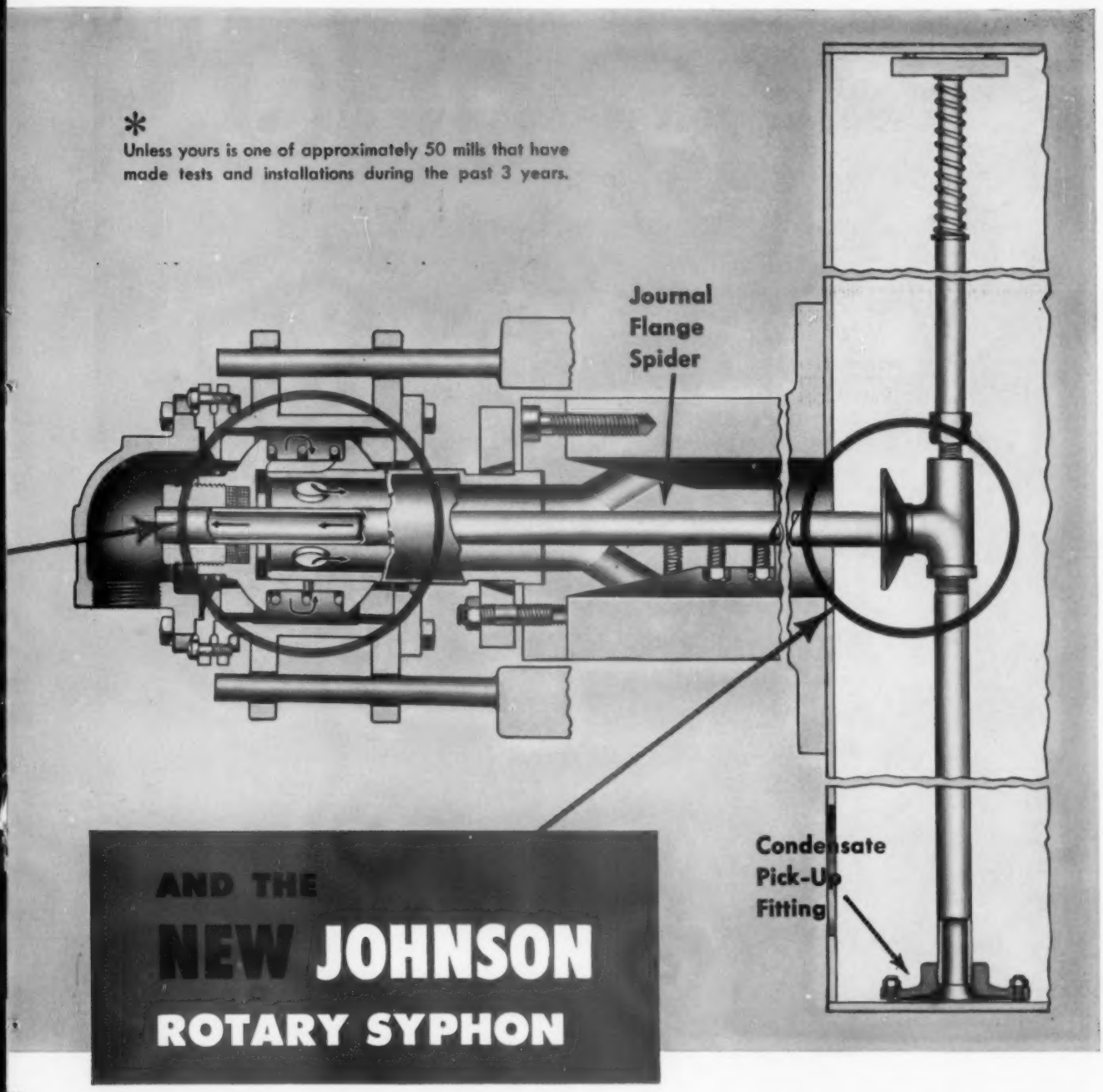
Trial offer still goes. We'll gladly furnish a pair of Joints and Syphons for 90-day trial in your own mill, without cost or obligation. Ask for details.

Engineers' Data Book summarizes research behind this new development, has full technical information. Ask for copy of: "Condensate Behavior in Paper Machines."

THE JOHNSON CORPORATION

849 WOOD STREET • THREE RIVERS, MICHIGAN

Rotary Pressure Joints • Direct Operated Solenoid Valves



*
Unless yours is one of approximately 50 mills that have made tests and installations during the past 3 years.

AND THE

NEW JOHNSON ROTARY SYPHON

Better Drainage of dryer rolls results from a new concept of condensate pick-up design. Holds condensate to a minimum. Rotary Syphon can be located any place along the dryer shell. Helps to reduce horsepower requirements.

Higher Roll Temperatures—Thinner condensate film means better transfer of heat units to dryer shell. Better drying can be translated directly into increased production.

Easier Installation—No need to get inside dryer to drill and tap dryer head. Install right through manhole. For rolls with handholes only there's even a journal-inserted rotary syphon.

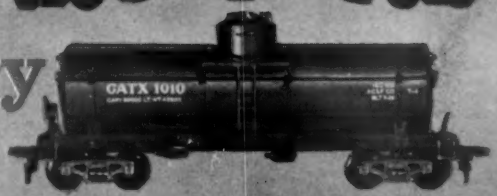
Reduced Maintenance—Only a few simple trouble-free parts. Ends bearing wear caused by unnecessary water weight and prolonged "cascading." Easily removed for inspection.

However you want your clays...

bag

bulk

slurry



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Approximately 10,000 carloads of clay per year are expedited by Huber's Traffic Department to all points of the compass. Our records and our customers' prove that barring nature's vagaries, *these shipments get to their destinations in record time* via the least expensive routing. You will find our Traffic Department's knowledge of shipping routes, rates, schedules and availability of box, tank and hopper cars to be without parallel in the industry.

All cars for Huber shipments are carefully inspected and cleaned, and all boxcars are paper lined prior to loading. Square, solid unit and palletized loads are rapidly handled and easily stored. Huber shipments arrive in top condition.

Ask for working samples of any of the clays in the complete Huber line.

HUBER

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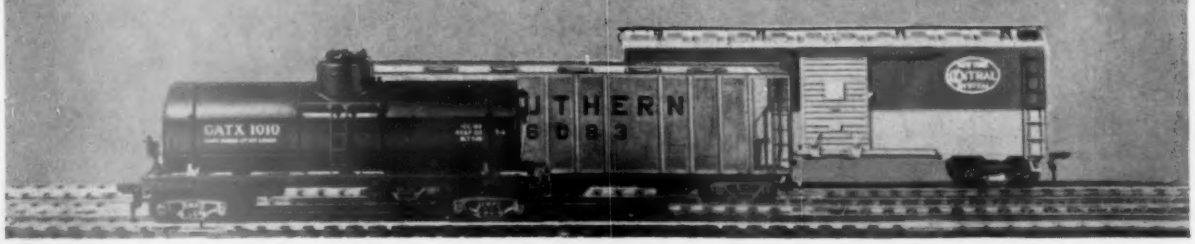
630 Third Avenue, New York 17, N.Y.

Mines & Plants: Huber, Ga.; Graniteville & Langley, S.C.



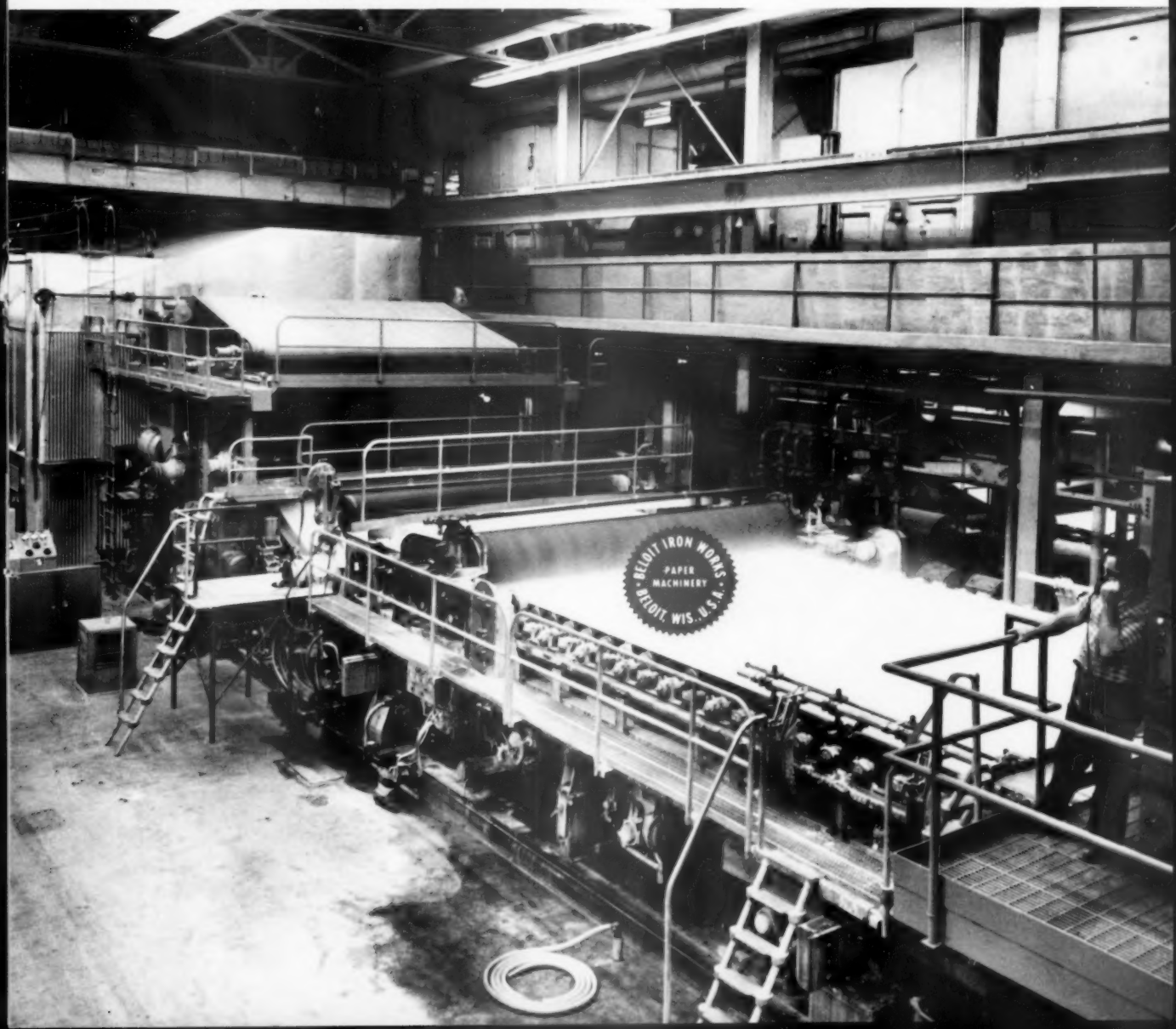
start-up report

...a new Beloit 195" fine papers machine at

Nekoosa®

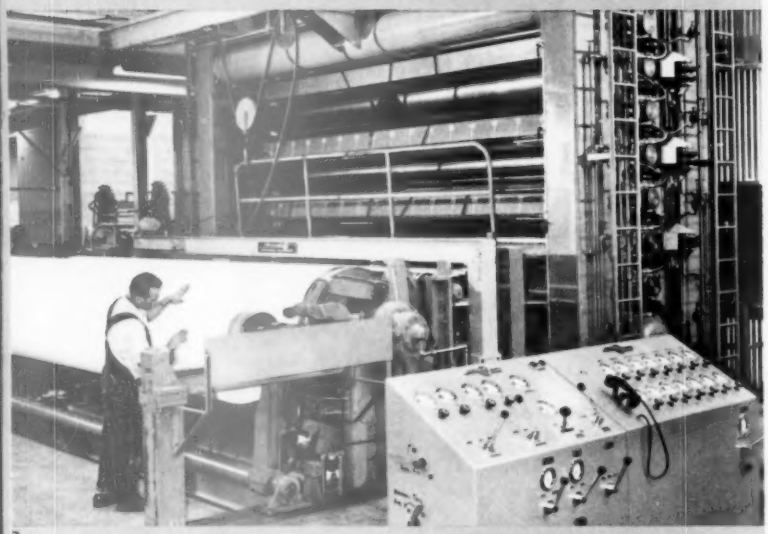
(for details, please turn page.)

Nekoosa-Edwards Paper Co., No. 2 Machine, Nekoosa Mill, Nekoosa, Wisconsin



Nekoosa's newest and largest fine papers machine

Designed for speeds in the 1500 fpm range producing Nekoosa's famous line of business and printing papers, this machine has a rated daily capacity of 170 tons. Brought into production at approximately 800 fpm on 40 pound offset bond, "The Charles H. Reese" increases Nekoosa's over-all productive capacity of quality papers more than 20%.



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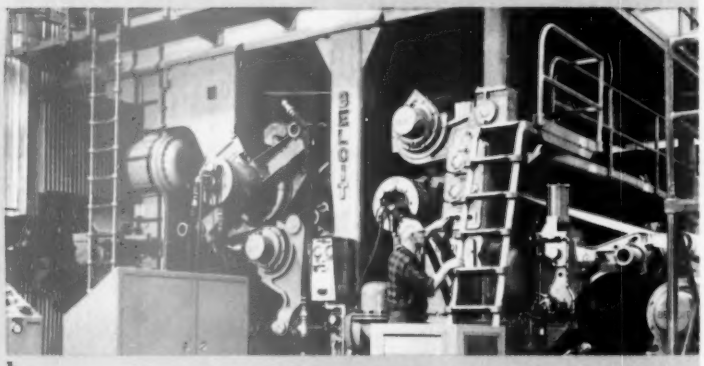

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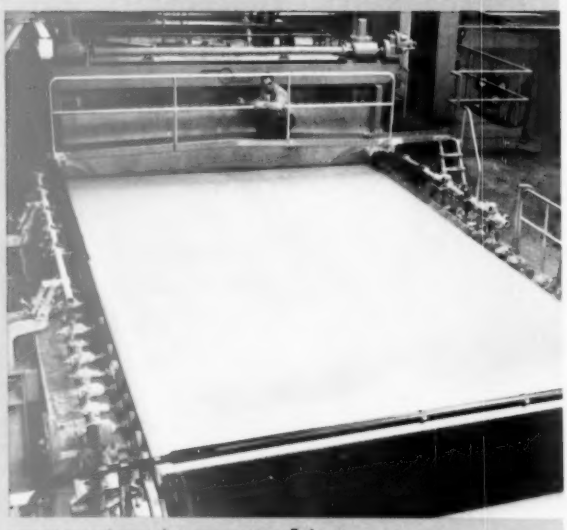
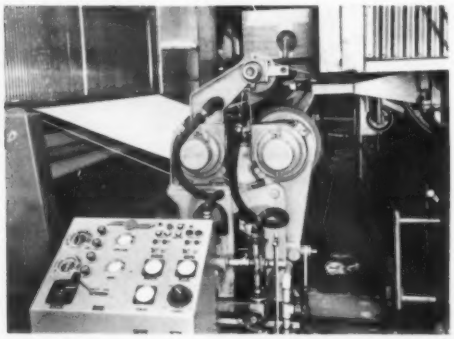


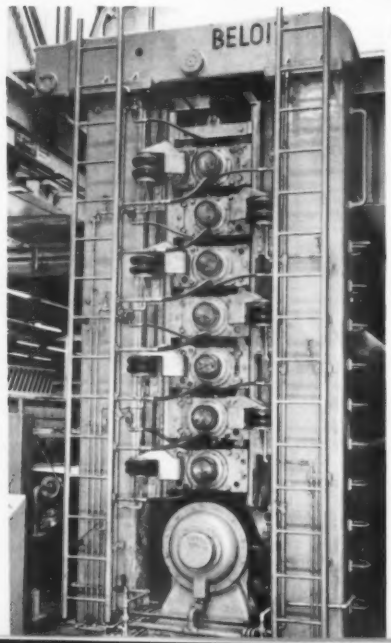
c

(a) Beloit LLR reel with 36″ constant speed drum. Control console is arranged for maximum operator convenience. (b) Straight-through press. Note inverse, air bleed second suction press and open draw arrangement for effective transfer of sheet from wire to felt. (c) Beloit Type E air-cushioned inlet and removable Fourdrinier. (d) Horizontal size press following main dryer section designed to apply size or light coatings. (e) Calender stack equipped with patented nip relief arrangement.



PHOTOS BY R. R. CHRISTENSEN

d



e

This insert is printed on 80# Nekoosa Handmade Finish Vellum

your partner in papermaking

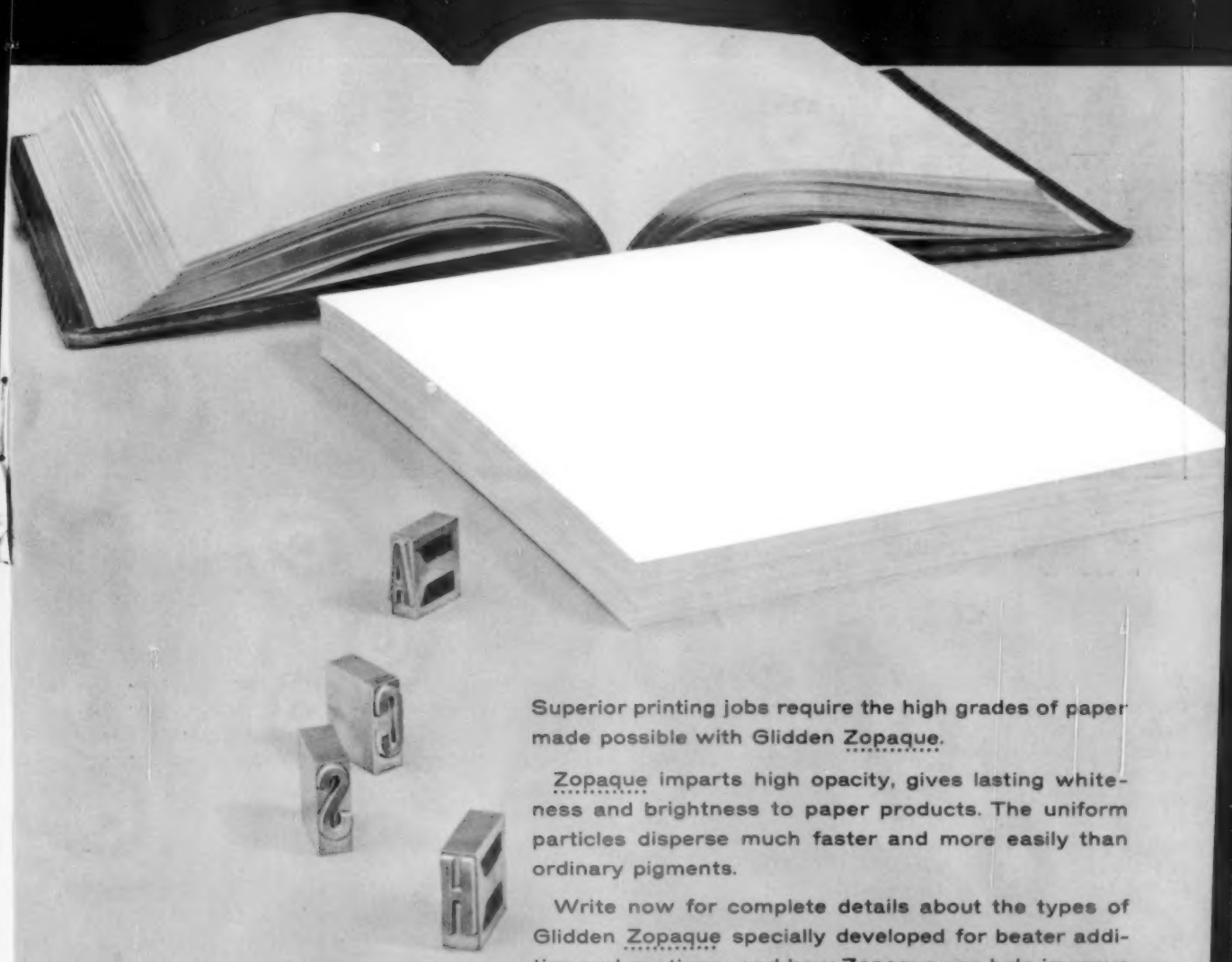
BELOIT IRON WORKS · PAPER MACHINERY · BELOIT, WIS., U.S.A.

BELOIT

PAPER MACHINERY

Highly Impressionable

Printing papers with finest reproduction qualities are made with Glidden Zopaque® Titanium Dioxide



Superior printing jobs require the high grades of paper made possible with Glidden Zopaque.

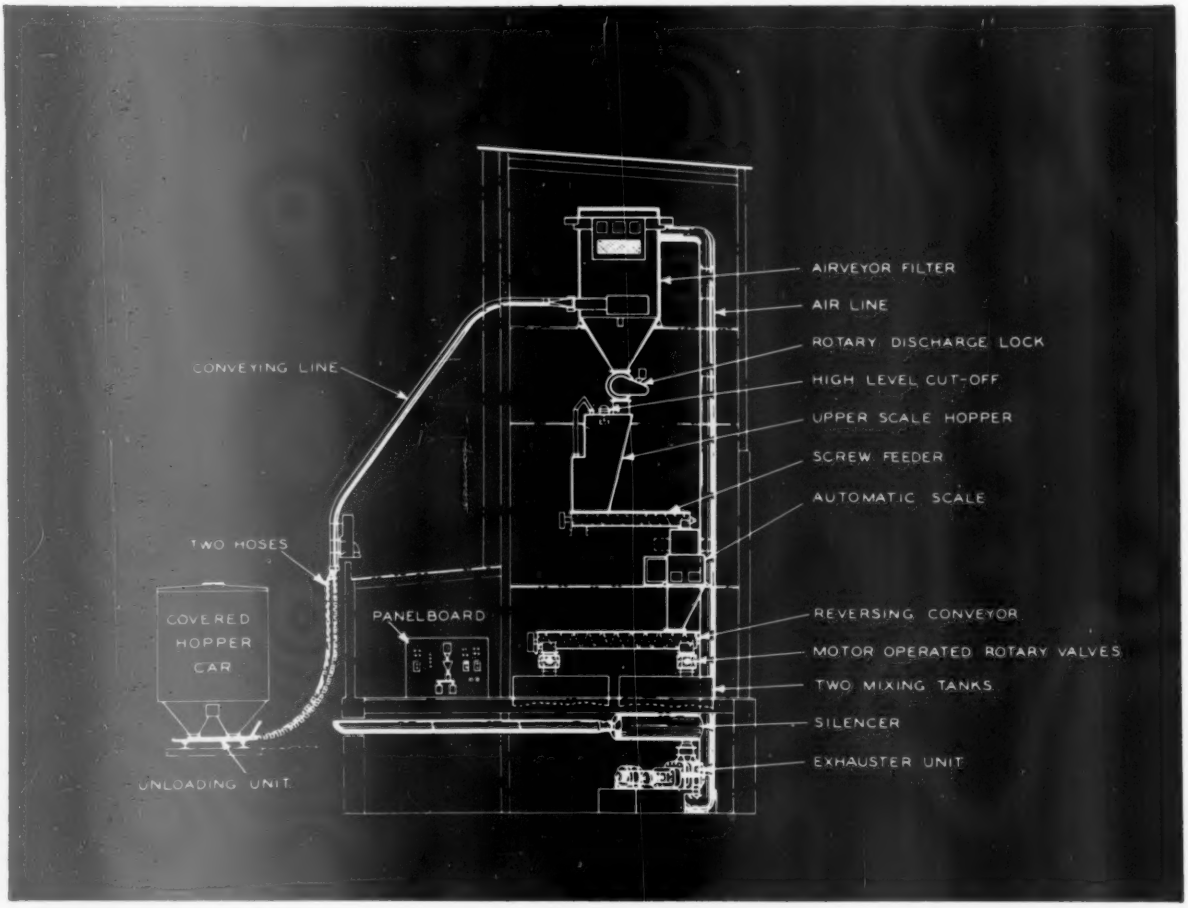
Zopaque imparts high opacity, gives lasting whiteness and brightness to paper products. The uniform particles disperse much faster and more easily than ordinary pigments.

Write now for complete details about the types of Glidden Zopaque specially developed for beater addition and coatings—and how Zopaque can help improve whatever paper products you manufacture.

QUALITY Glidden PRODUCTS

THE GLIDDEN COMPANY
FINEST PIGMENTS FOR INDUSTRY
Chemicals Division • Pigments and Color Dept.
Baltimore 26, Maryland

(This advertisement is printed on paper stock containing Glidden ZOPAQUE Titanium Dioxide.)



Fuller conveying system helps paper mill cut clay handling time 65%

At New York & Pennsylvania Company's Johnsonburg, Pa., paper mill a new completely automatic clay slip preparation tower speeds production. New unloading equipment has a capacity of 25 tons per hour. This is in contrast with the old manual method in which 6 men worked 5 hours to unload 30 tons of bag clay. How did New York & Penn do it? With a pneumatic conveying system designed and built by the Fuller Company.

Clay is delivered by railway car. Each car holds 50 tons of clay which drops by gravity through outlets directly into the unloading unit then into the conveying system. This consists of two 5-in. flexible hoses connecting into a main 8-in. conveying line. Clay is conveyed through a Fuller Airveyor® system to an Airveyor filter on the top floor of the building. From the filter, the clay is discharged into a surge hopper through a totally-enclosed Fuller rotary airlock. A Fuller high-level indicator on the hopper automatically opens a vacuum breaker in the conveying line in the event that clay is unloaded faster than the equipment following the hopper can take it away.

In addition to eliminating a manual operation, the enclosed Fuller system has reduced New York & Penn's clay loss and improved their dust problem. Fuller's wide variety of conveying systems and components can help solve your problems, too. Why not write us today?

See Chemical Engineering Catalog for further details and specifications.

1951
A 287

FULLER COMPANY
GENERAL AMERICAN
TRADE MARK

FULLER COMPANY
128 Bridge St., Catasauqua, Pa.
Subsidiary of General American Transportation Corporation

Offices in principal cities throughout the world

Fuller
....pioneers in harnessing AIR

POWELL PERFORMANCE PAYS OFF

Any way you look at it, Powell valve performance really pays off for the pulp and paper industry.

Since Powell pioneered the application of special alloys in valve design, you can today find industry's widest choice of valve materials for any problem of heat, temperature—corrosion or erosion caused by pulp and paper chemicals, liquors, bleaches and caustic compounds.

On the line, you'll also find Powell valves suitable for pneumatic, hydraulic or electric operation . . . and overall workmanship and construction that result in minimum downtime and low cost maintenance.

Learn how this Powell valve performance can pay off in your pulp and paper operations by contacting your nearby Powell Valve distributor or write The Wm. Powell Company, Cincinnati 22, Ohio.

150-pound W.P. Quick Opening Gate Valve. Bolted flanged bonnet, solid wedge, integral seat. Sliding stem can be locked in any desired position. Sizes, 2½" through 6"; with screwed ends, 2½" through 4".

150-pound Bronze Swing Check Valve. Bolted flanged Cap. Disc has sufficient lift to clear line of flow. Sizes, 2" through 8". Screwed end valves available in sizes 2" through 3".

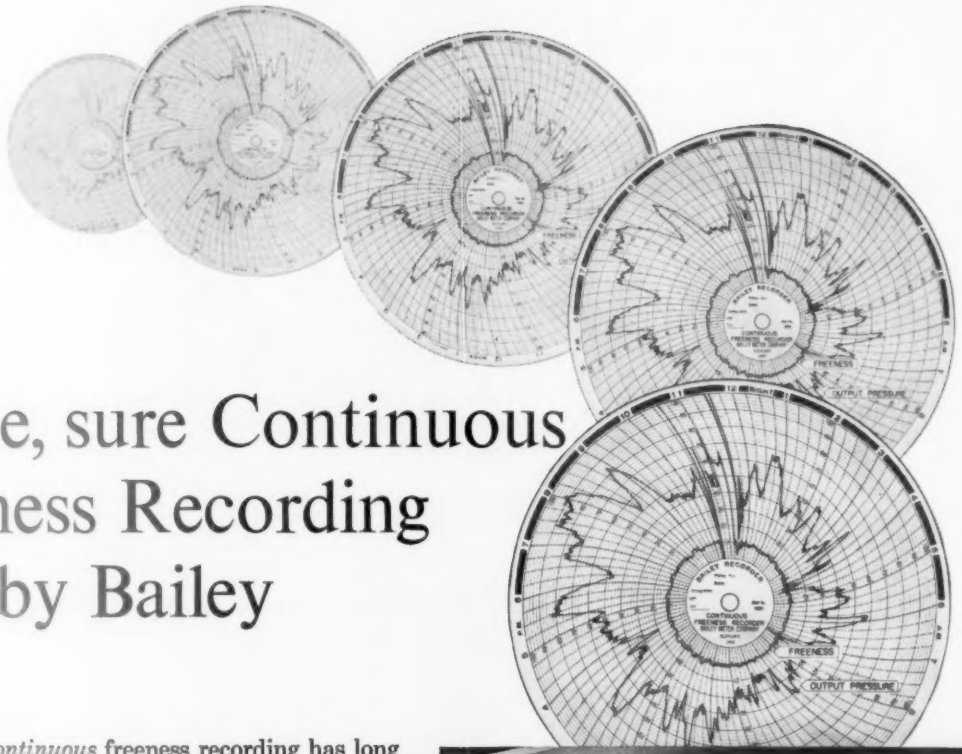
200-pound W.O.G. Gate Valve. Body, bonnet, yoke, gland are Ni-resist. Solid wedges are Ni-resist with 316 stainless steel facing. Other trim parts are 316 stainless steel. Sizes, one-piece yoke, 4"; two-piece yoke, 5" through 12".

115th year of manufacturing industrial valves for the free world

POWELL PAPER MILL **VALVES**

THE WM. POWELL COMPANY CINCINNATI 22, OHIO

Now...proved in continuous operation...



simple, sure Continuous Freeness Recording by Bailey

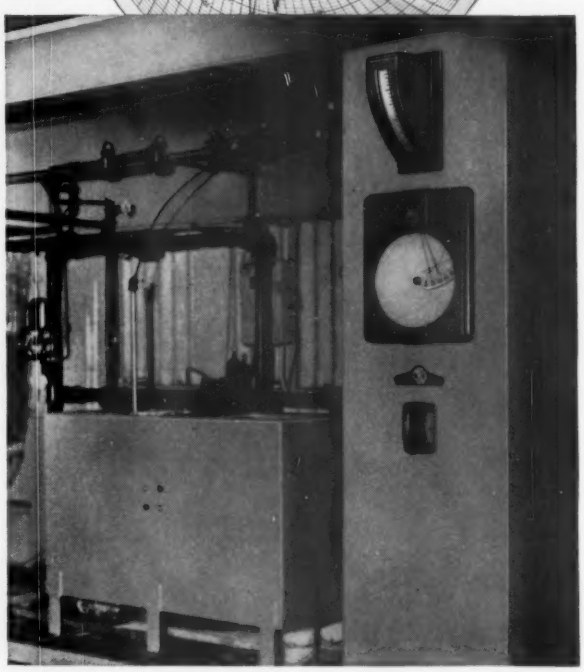
Dependable, *continuous* freeness recording has long been an objective of the pulp and paper industry.

Today it is a fact.

The Bailey Continuous Freeness Recorder, based on simple principles and utilizing equipment well-known by the pulp and paper industry, now provides a means for dependable, continuous measurement of freeness, proved in successful, continuing service for more than a year.

Its operation enables more accurate control of pulp stock characteristics...automatic control of refiners and jordans for sustained product quality. Performance is trouble-free . . . maintenance, negligible. Your Bailey Engineer will be glad to give you details. Call your nearest Bailey District Office, or write.

P151-1



Bailey Continuous Freeness Recorder in operation at a Southern newsprint plant.

PULP AND PAPER DIVISION

BAILEY METER COMPANY

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In Canada — Bailey Meter Company Limited, Montreal

BAILEY METERS

NIGHT AND DAY

twenty-four hour service

PUMPS • WATER WELLS • WATER TREATMENT

Layne knows that an unfailing supply of water is vital, whether it be for municipal, industrial or agricultural use. With Associate Companies located throughout the world, Layne can provide the speed, the trained technicians and the quality parts to remedy your water problem. Over 75 years of experience accounts for the ever increasing list of customers who depend on Layne for service. For service night and day, call the Man From Layne.

Write for Layne Service Bulletin 100.

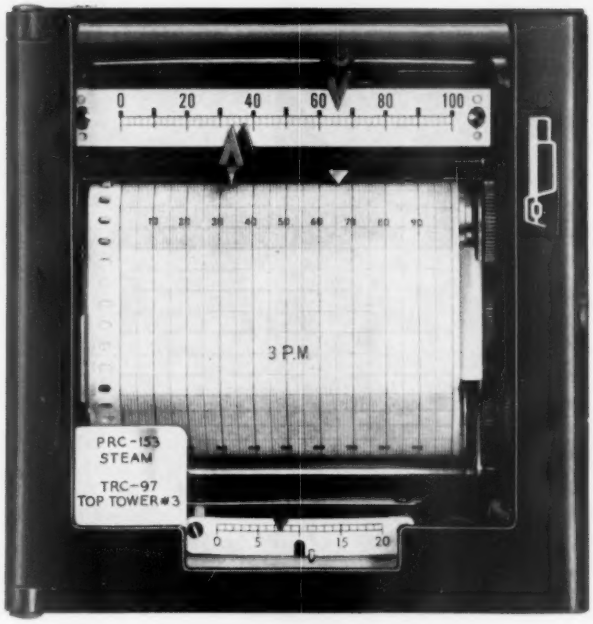
LAYNE OFFERS COMPLETE WATER SERVICE: Initial Surveys • explorations • recommendations, site selection • foundation and soil-sampling • well drilling well casing and screen • pump design, manufacture and installation • construction of water systems • maintenance and service • chemical treatment of water wells water treatment—all backed by Layne Research. Layne services do not replace, but coordinate with the services of consulting, plant and city engineers.

LAYNE & BOWLER, INC., MEMPHIS

General Offices and Factory, Memphis 8, Tenn.

LAYNE ASSOCIATE COMPANIES THROUGHOUT THE WORLD

SALES REPRESENTATIVES IN MAJOR CITIES



New Bristol Series 670 Metagraphic receivers measure only 7" wide by 7⅛" high on panel, come in a wide selection of models, including 1-, 2-, and 3-pen models and models with manual-automatic, manual-cascade, and manual-automatic-cascade control stations.

Now: the USER-PLANNED Receiver *New Bristol Metagraphic*

offers you more features for easy installation, flawless operation, and fast, no-down-time servicing than any other 4-inch-chart pneumatic receiver.

At last, here's the ideal pneumatic receiver for graphic panel applications.

It's Bristol's new Series 670 Metagraphic, the receiver with complete plug-in versatility and convenience, plus these new user-designed features:

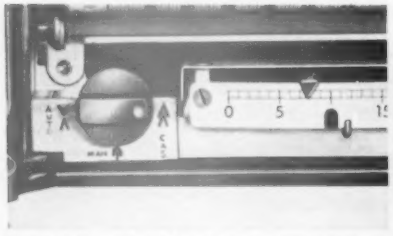
Simplified control switching between functions—Allows the easiest start-up procedures for automatic or cascade operation. Just adjust process to line up color-coded indicators and switch to automatic or cascade operation as desired.

Uniform control switching—All receiver models have the same convenient, easy-to-remember switch positions for the various types of control: cascade position; 3 o'clock; manual position, 6 o'clock; and automatic position, 9 o'clock.

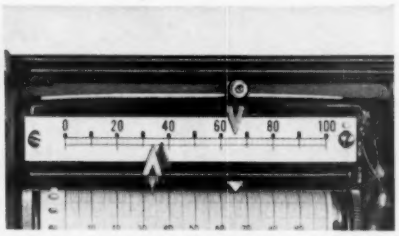
Simplified chart change and inking—Chart changing is a one-hand operation. A new chart can be slipped into place in an instant. The capillary inking system can be filled from the front of the receiver.

And that's not all: Series 670 gives you such outstanding features as rectilinear chart coordinates for easiest reading, easy connections for any type of control, and sparkless mercury-switch disconnect of electrical circuit when plug-in chassis is withdrawn.

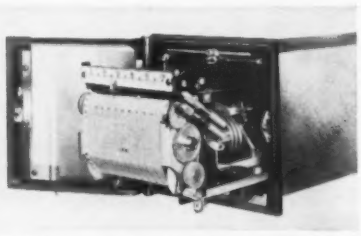
Write for complete data on the new Series 670 today. The Bristol Company, 143 Bristol Road, Waterbury 20, Conn., a Subsidiary of American Chain & Cable Company, Inc. 0.43



Simplified, uniformly-planned control switching facilitates process start-up and operator training.



Brightly-colored distinctively-shaped pointers signal process deviation from set-point, even at a distance.



Complete plug-in versatility—long a Metagraphic feature—insures continuity of service.

BRISTOL... for improved production through measurement and control

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

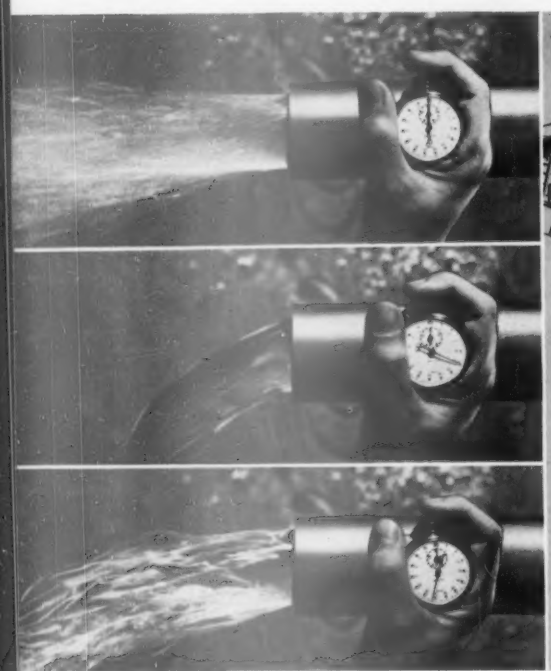
TOWMOTOR'S ON THE MOVE

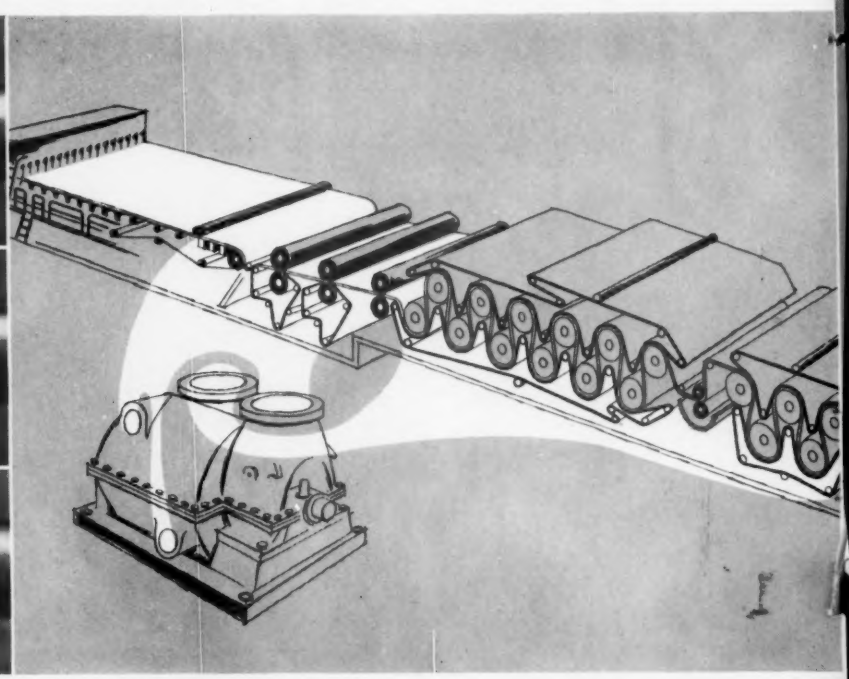
—setting the pace with good functional design, plenty of power, unusual agility! Integrating frame, body, engine, pumps and lift components for most effective mass-handling. Introducing new advances in centralized control, full vision seating, fatigue-free steering. Keep moving with Towmotor fork lift trucks—made only by TOWMOTOR CORPORATION, CLEVELAND 12, OHIO.

TOWMOTOR
THE ONE-MAN-GANG ®

Quick, easy access to entire engine compartment is a significant feature of new Towmotor "Pace-Maker" Series fork lift trucks (above), with load capacities up to 12,000 pounds. Tilt-back seat, hinged hood, slip-socketed panels expose service parts in 30 seconds without tools.

ideas and news:





ACAP pump regulates flow instantly . . . without valves or varying pump speed. Proven ACAP (Adjustable Capacity, Adjustable Pressure) principle with internal pneumatic control automatically matches flow to demand. Regulation of flow through changing impeller clearances eliminates binding, plugging, saves power, allows system to operate at high efficiency regardless of demand.

New VACU-THERM system inhales water, exhales hot air . . . The centrifugal exhauster used in this new system makes it uniquely superior to conventional vacuum systems for paper machines. This exhauster permits a large percentage of input energy to be reclaimed . . . heat of compression yields hot dry air for the paper-drying cycle. Constant pressure is maintained over a wide range of volumes and paper porosities. No make-up water required. Less floor space needed. And Allis-Chalmers engineers the complete system: controls, separators and exhauster.

Which of these productive ideas could be working for you?

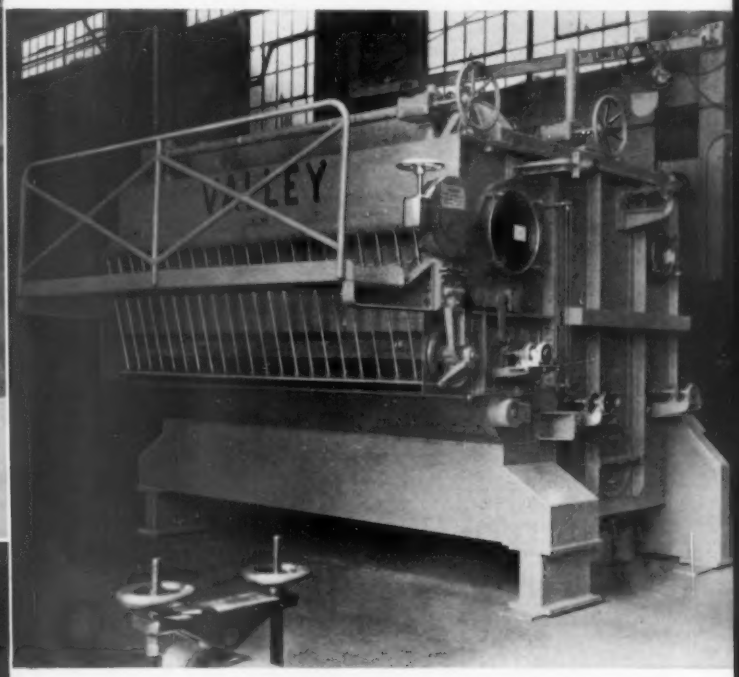
A pump that adjusts automatically. A valve that offers zero flow resistance. A vacuum system that produces usable heat. These examples demonstrate the extra value that is a standard with A-C... the greater efficiency and the added productivity which are yours when you buy A-C products, systems and services. Call your Allis-Chalmers representative for details on A-C "worth-more" features. Or write Allis-Chalmers, Industries Group, 903 South 70th Street, Milwaukee 1, Wisconsin.

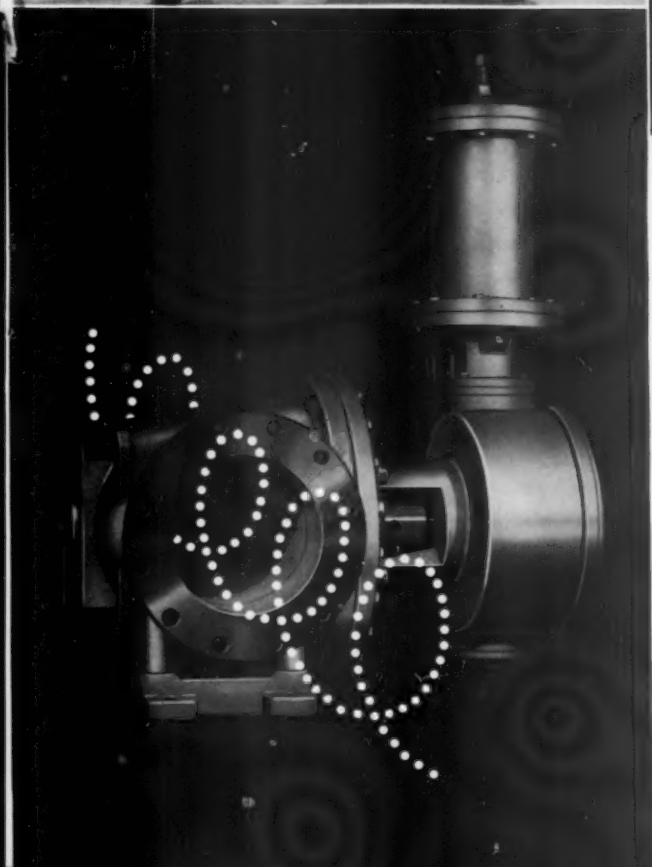
ACAP, *Rotovalve* and *Vacu-Therm* are Allis-Chalmers trademarks.

A-1456

Water vandals turn into "weaklings" . . . with A-C deaerating hot process softener. At this plant scale and corrosion can't damage the boiler system. This one-two punch hot process softener and deaerator combination prevents hardness and silica salts from causing dangerous scale deposits in the boilers. Oxygen and corrosive gases are eliminated when water passes through the stainless steel deaerator section with its unique counterflow design thoroughly scrubbing dissolved gases from the water. Result: Harmful contaminants never reach the boiler-steam system equipment.

"On-the-fly" adjustability . . . speeds production, ends costly machine shutdowns. New — from Valley Iron Works Corporation, an Allis-Chalmers subsidiary — a headbox that allows you to change from velocity formation to pressure formation, control turbulence . . . all "on-the-fly." Offers pressure and vacuum loading, both adjustable during operation.





"Open road" for unrestricted flow . . . This ROTOVALVE, when wide open, offers no greater resistance to flow than a straight pipe of equivalent length. Promotes lower pumping costs. Actually seats itself tighter with use. And special shutoff characteristics reduce water hammer. All moving parts are totally enclosed, yet easily accessible.

ALLIS-CHALMERS PRODUCTS FOR THE PAPER INDUSTRY: Look to Allis-Chalmers for compressors; controls; earth-moving equipment; industrial systems; lift trucks; motors; paper-making machinery; pumps; rectifiers; electrical generation and distribution equipment; tractors; transformers; unit substations; valves; water-conditioning equipment.

ALLIS-CHALMERS

What's this about FREE FLOW?

FELKERWELD

FREE FLOW FLARED PORT HEADERS

* NO STOCK HANG-UP

Here is another FelkerWeld Freeflow product! The six port header above illustrates the advantages of FelkerWeld Flared Port design. For your protection we furnish only .03 max carbon stainless steels, properly welded with extra low carbon stainless steel wire, either semi-automatic, full-automatic or metallic-ARC depending on the application. Why chance the possibility of reduced corrosion resistance?

The close up view shows the weld at the juncture of the port to the body at a point accessible for good clean-up on the inside during fabrication. The port is actually flared from the body of the header . . . resulting in a cleaner inner surface which will not cause hang-up of stock. Write for complete details.

FELKER BROS.
MANUFACTURING CO.
MARSHFIELD, WISCONSIN

...and for CHLORINE see PENNSALT

Pennsalt started making chlorine over 50 years ago . . . and has been a dependable supplier to pulp and paper mills ever since. Modern, strategically-located plants and shipping centers are ready to serve you wherever you are . . . by barge, rail or truck. And Pennsalt Technical Service gives you expert aid on handling and storing. Call your nearest Pennsalt sales office for full information. Industrial Chemicals Division, PENNSALT CHEMICALS CORPORATION, Three Penn Center, Philadelphia 2, Pa.

See our complete listing in Chemical Materials Catalog

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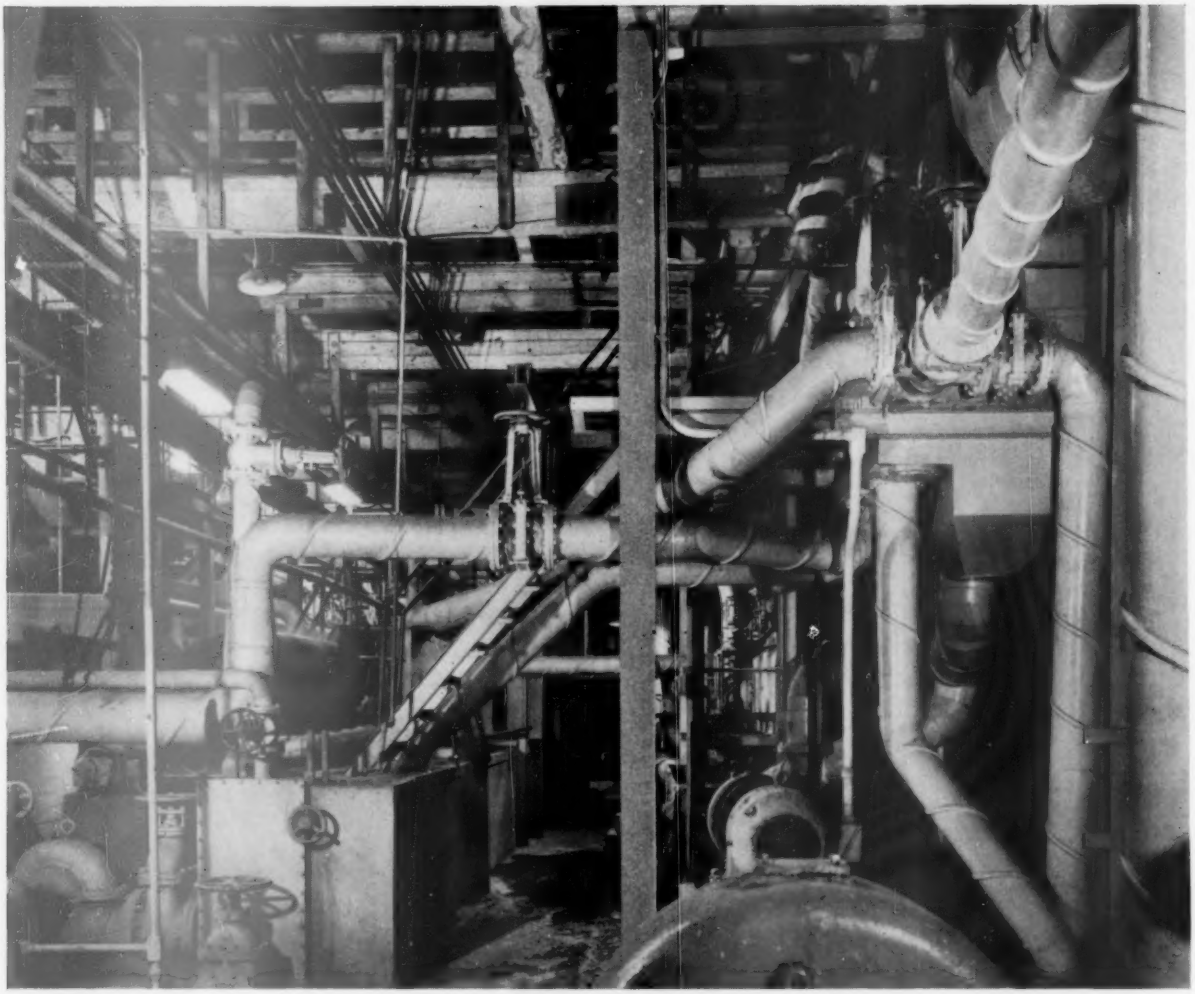
Pennsalt Chemicals
ESTABLISHED 1850

Why It Pays to Call on NAYLOR FABRICATION SERVICE for Piping Needs



No matter what you need in pipe, fittings or special fabrications, you'll find NAYLOR fabrication service a dependable source.

NAYLOR can meet your exact specifications whether you require carbon steel, stainless steel, or alloys. Close-tolerance production assures a perfect fit on simple or complex layouts.

Pipe sizes range from 4″ to 30″ in diameter and wall thicknesses from 14 to 8 gauge. Special piping fabrications from 3″ to 44″ in diameter and wall thickness up to ⅜″. Standard fittings are available from stock.

Write for Bulletin No. 59 or send specifications for quotations

NAYLOR PIPE *Company*

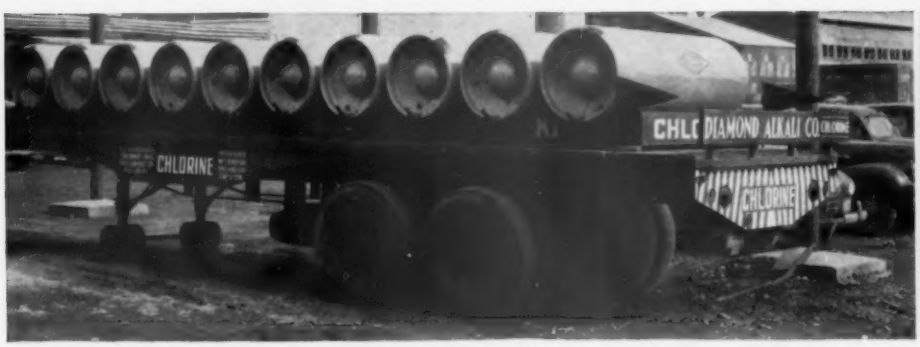
1271 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

Diamond delivers the Chlorine

by inland waterway...by the bargeload

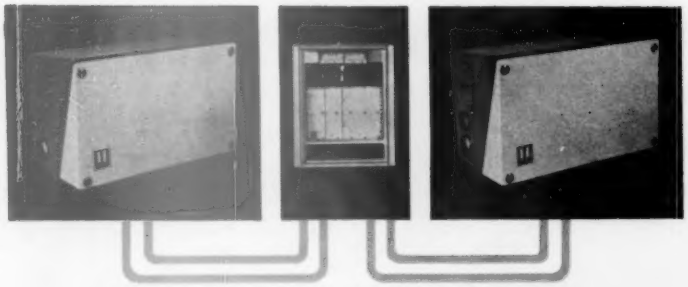
by tank cars...or by the cylinder or container



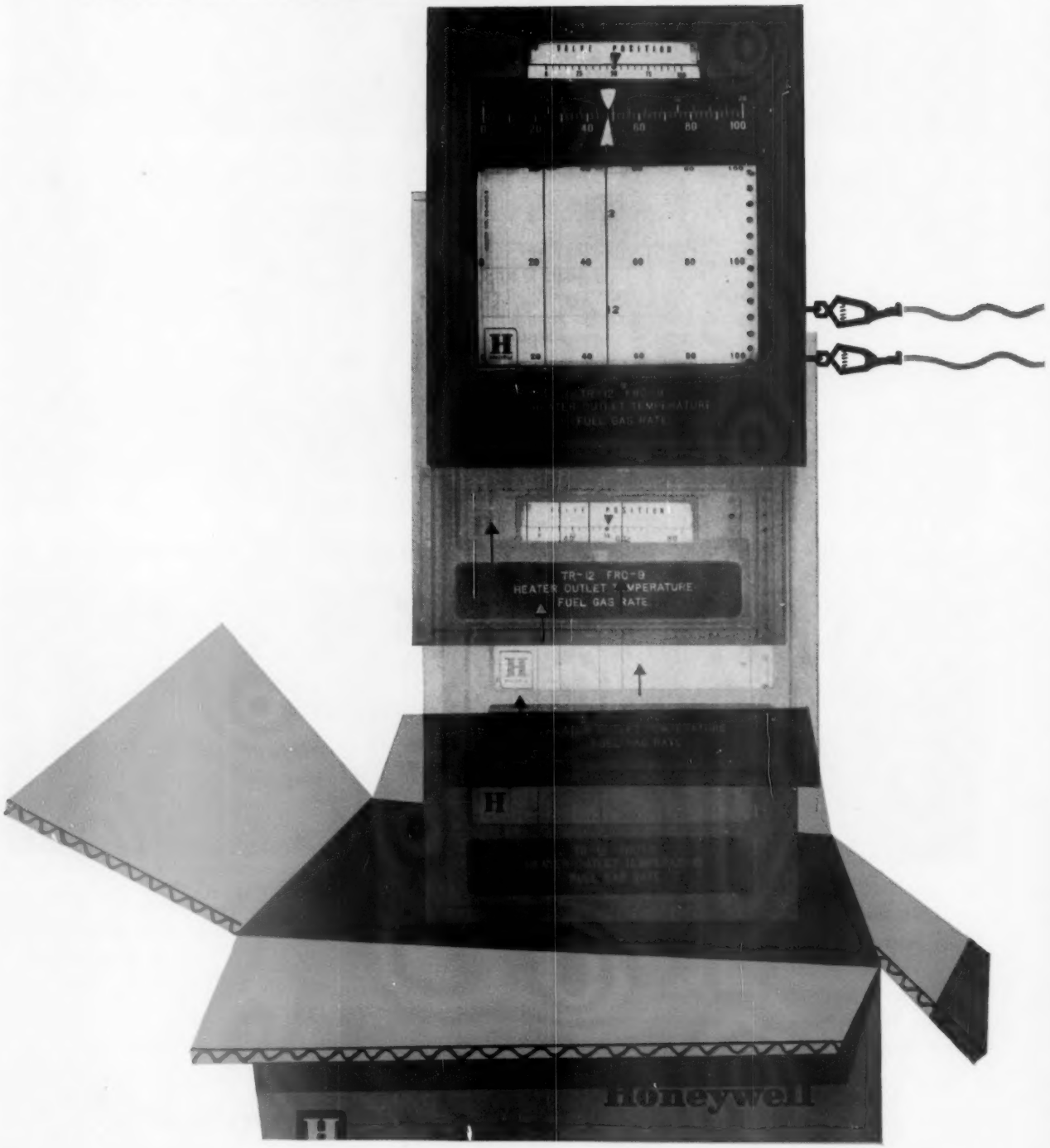
It doesn't matter how great your requirements or how small—DIAMOND delivers liquid chlorine to you at the lowest possible cost from four strategically located plants.

What's more, it's a safe delivery—and a uniform one. DIAMOND has its own producing plants, research and development laboratories, and its own shipping containers. DIAMOND offers trained technical assistance to advise on the economical use of chlorine. For the DIAMOND "Chlorine Handbook", write DIAMOND ALKALI COMPANY, 300 UNION COMMERCE BLDG., CLEVELAND 14, O.

Diamond Chemicals



ElectriK Tel-O-Set—the true 2-wire system



This "Loop Snooper" adds to the extraordinary ease of installation and maintenance you'll find in the *ElectriK Tel-O-Set* System. It's a portable test instrument that can accurately check . . . from the control panel . . . any *Tel-O-Set* unit in the field, to make sure signals are being received and sent exactly as they should be. Or it can operate and check a recorder chassis, indicator chassis or controller on the bench, with local power. The "Loop Snooper" removes trial and error from installation and maintenance.

SIMPLEST TO INSTALL, ADJUST AND MAINTAIN

The *ElectriK Tel-O-Set* System has many features that save time in getting on stream, and keep maintenance to a minimum. For example, all process connections are isolated from the inside of *Tel-O-Set* transmitter and transducer cases, so that you can mount, pipe and wire the instruments without removing their covers. Instrument chassis can be removed for servicing without breaking any external process or electrical connections. Standardized parts and extensive use of quick-connect and plug-in design cut downtime and spare parts requirements.

No external power is required at any field-mounted *Tel-O-Set* instrument; line power is connected only at the receiver. Two-wire d-c transmission eliminates shielding and further reduces installation costs. The 4-20 milliamp signal range gives a *live* zero through the use of readily available reliable transistors.

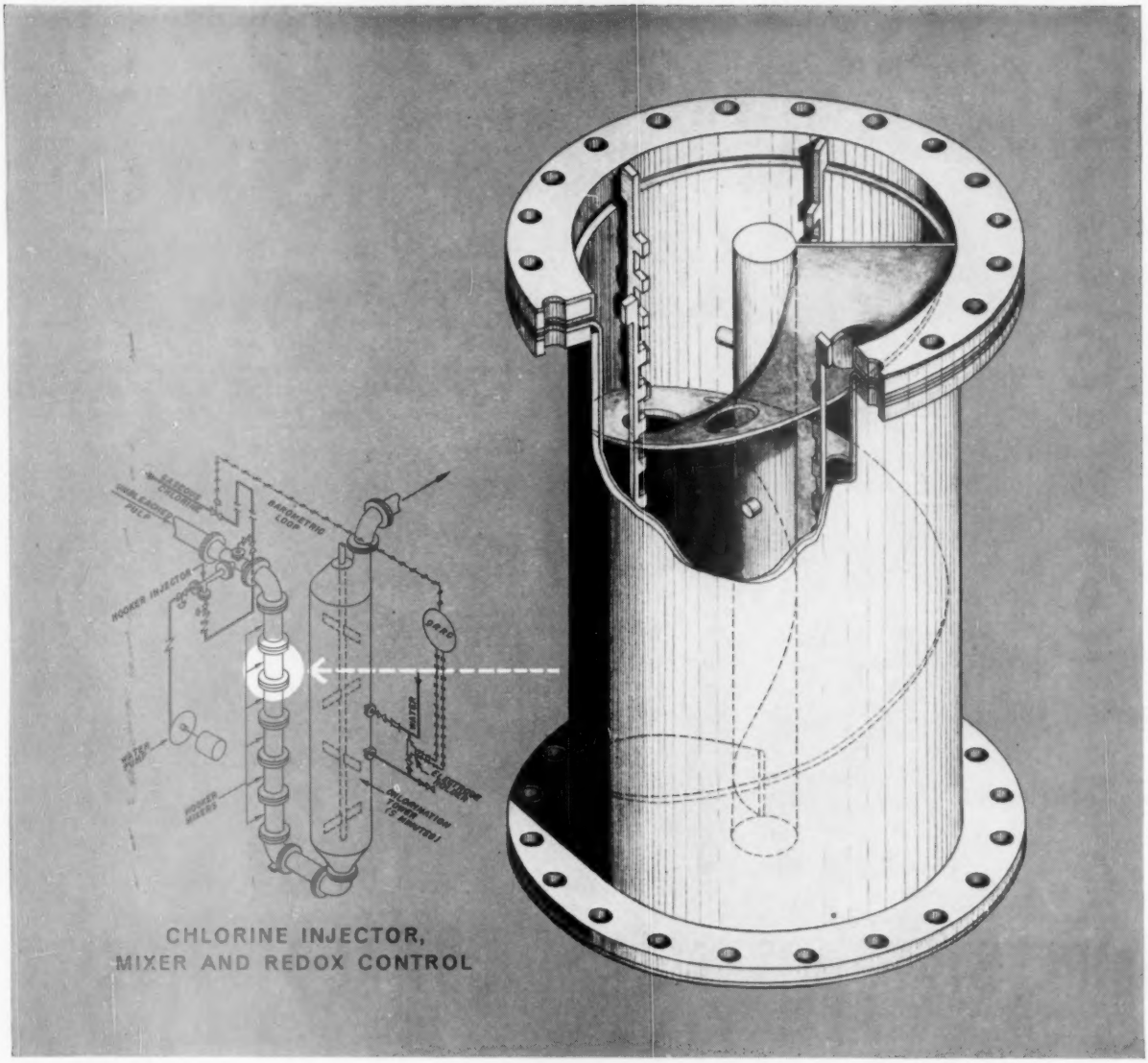
Your nearby Honeywell field engineer can tell you how *ElectriK Tel-O-Set* advantages relate to your particular control requirements. Call him today . . . he's as near as your phone. Or write to MINNEAPOLIS-HONEYWELL, 21 Penn Street, Fall River, Massachusetts.

Honeywell

First in Control

SINCE 1885

HONEYWELL INTERNATIONAL Sales and Service offices in all principal cities of the world. Manufacturing in the United States, United Kingdom, Canada, Netherlands, Germany, France, Japan.



CHLORINE INJECTOR,
MIXER AND REDOX CONTROL

Another step to better pulp chlorination: stock line chlorine-pulp mixing

Now, a different kind of chlorine-pulp mixer—developed with typical Hooker chemagination—puts an end to the guesswork in pulp-chlorine mixing.

This rugged mixer breaks up fiber clumps and distributes the chlorine uniformly throughout the pulp slurry so that each fiber receives the same amount of chlorine.

Thorough mixing with Hooker mixers means higher pulp strength, higher brightness, easier control of subsequent bleaching stages, more uniform pulp quality, and reduced chlorine consumption.

Costs go down and profits go up.

Successful control of chlorine addition by redox potential requires thorough chlorine-pulp mixing. Hooker mixing in combination with Hooker chlorine injection, redox control, and retention-time control adds even more to increased profits.

Hooker technical service engineers will be happy to help you design and install these important components.

For further details on all these Hooker pulp-chlorinating components, write for descriptive literature.

HOOKER CHEMICAL CORPORATION

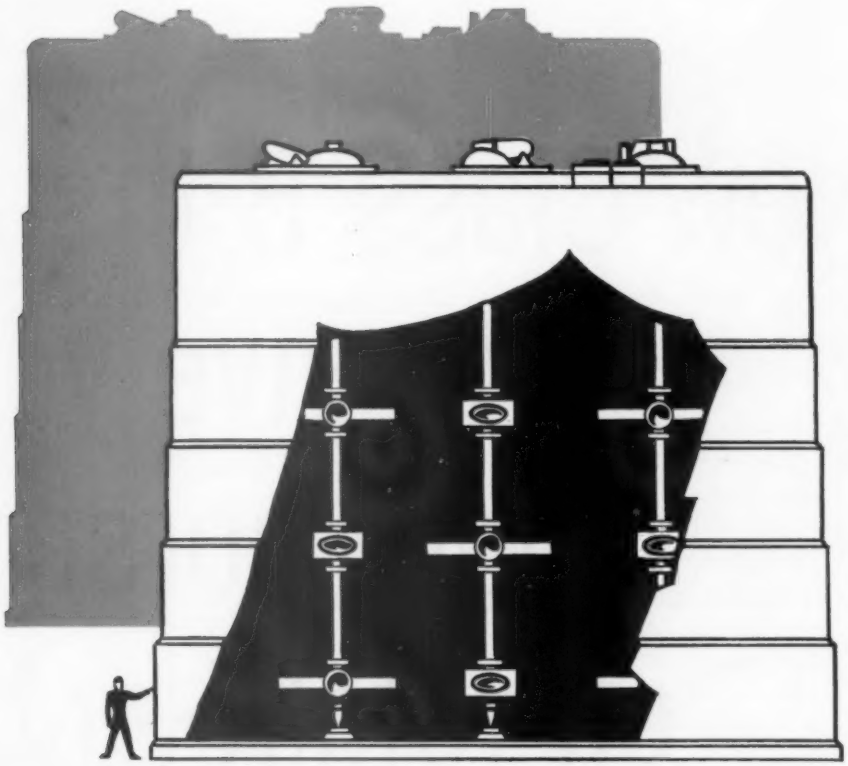
HOOKER CHEMICALS PLASTICS

1907-2 FORTY-SEVENTH ST., NIAGARA FALLS, N. Y. • 605 ALEXANDER AVE., TACOMA, WASH.

Sales offices: Buffalo, Chicago, Detroit, Los Angeles, New York, Niagara Falls, Philadelphia, Tacoma, Worcester, Mass. *In Canada:* Hooker Chemicals Limited, North Vancouver, B. C.

From S. W. Hooper: increased mill production through large-volume blending

The storage tank, source of stock uniformity



Better blending means improved paper production and quality. Volume of output at the desired paper quality depends in practice on the volume of blended storage. Tank capacity must therefore be adequate yet consistent with thorough agitation at economical power.

Replacing blades and paddles with the Cowan agitator — in effect a high-volume low-head pump — has permitted measurable full blending with low power consumption. Cowan-designed agitation units are at work in storage tanks of extremely large diameter. Their success demonstrates that thorough blending of tank content at moderate power is fully compatible with large storage capacity.

Agitation in large-diameter tanks is something we look forward to discussing with you. We will act promptly on your letter, phone call or wire.

S.W. HOOPER CORPORATION

Manufacturers of pulp and paper mill equipment
P.O. Box 129, Delmar, N.Y. Telephone HEmlock 9-5231

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In Canada: S. W. HOOPER & CO. LTD. 5460 Patricia Avenue, Montreal 29. Telephone HUnter 1-1161

The Westinghouse man with the motors brings you—

New Class B Insulation to give you 15% more horsepower on totally-enclosed Life-Line motors

Now Class "B" Insulation replaces Class "A" *as standard* on totally-enclosed 1-250 hp Life-Line a-c motors giving you these advantages:

Added capacity . . . Operation at 15% over nameplate rating without reduction in motor life.

Longer life . . . 80% to 100% longer life at rated loads than motors with Class "A" Insulation.

This newly designed motor is engineered to give top performance in a wide range of applications. On-the-line experience in the steel industry, where maximum reliability is essential, has proved its higher output, longer life and lower maintenance under the toughest conditions.

For the ultimate in protection specify Guardistor* on all Westinghouse motors. This exclusive built-in static motor protection allows the use of maximum horsepower over long periods with no danger of motor burnout.† For additional information ask for booklet B-7876-A.

Your Westinghouse sales engineer can supply you with complete details on these money-saving motors. Call him for full information on how they can fit into your production scheme. Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania.

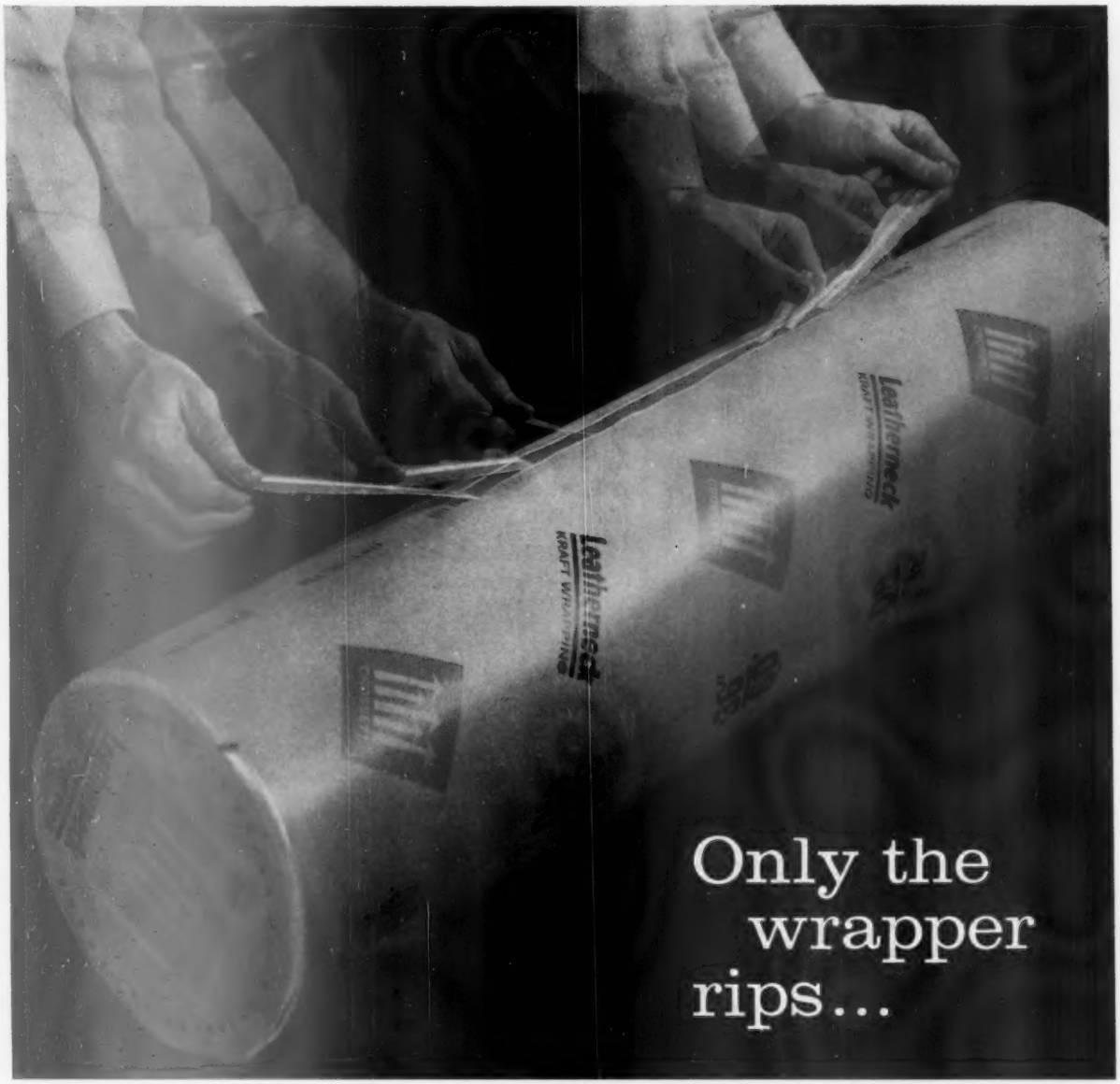
You can be sure . . . if it's Westinghouse.

*Trademark

Westinghouse

†Warranty: Westinghouse GUARDISTOR MOTORS on frames 182-445 inclusive are guaranteed for one year against burnouts due to overheating resulting from: overload, locked rotor, blocked ventilation, bearing seizure, single phasing, unusual duty cycle, high ambient, or voltage unbalance, providing the Guardistor elements are connected in a control circuit so that the motor is removed from the power source in the event of over-temperature.

J-22170



CROSSETT PAPER MILLS ADDS EASY OPENING SALES APPEAL TO ITS ROLLS OF LEATHERNECK KRAFT WRAPPING

"Scotch" Brand tear strip tape delivers quality right to your customer's hands

Now it's a cinch for customers to remove heavy roll overwraps without damaging the paper on the roll . . . just as easy as opening a pack of cigarettes. The secret: A built-in "zipper" of "Scotch" Brand Tear Strip Tape.

The tape is applied automatically to the underside of the overwrap stock before wrapping. Short "grab tabs" of strong tear strip tape are left exposed in the center of the roll.

To open, your customer gives each strip a simple, easy pull. No cutting. No gouging. No wrinkling. Only the wrapper tears.

For more information on this easy-to-apply, easy-to-use tape from 3M and for information about 3M-Matic applicators, contact your nearest "Scotch" Brand Tape Distributor, or write: 3M Company, 900 Bush Avenue, St. Paul 6, Minnesota, Dept. 1BT-71.

SCOTCH BRAND
tear strip tape

MINNESOTA MINING AND MANUFACTURING COMPANY
...WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

"SCOTCH" IS A REGISTERED TRADEMARK OF 3M CO., ST. PAUL 6, MINN.

MEET THE *Lindsay* SALES AND TECHNICAL SERVICES STAFFS

These men are always ready to visit your mill and consult with you regarding any Fourdrinier wire problems that may arise.

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THE WIRE WEAVING COMPANY
CLEVELAND 10, OHIO

A MEASURE OF PERFORMANCE. After two years' service during which power requirements varied between 600 and 1000 hp, these nickel stainless steel discs show wear averaging only .0027" per month, evenly distributed and with parallelism retained. *Photo courtesy E. D. Jones Corp., Pittsfield, Mass.*

Resist corrosion and erosion

Nickel stainless steel discs figure to last more than 23 years

Take note of this date: September 7, 1957.

That was the day a nationally known paper company began board production, using 10 Jones Double-D refiners for primary and secondary refining of highly corrosive pulp. Each refiner is equipped with nickel stainless steel discs through which the pulp is refined.

Two full years passed. Late in 1959, inspection of the all-important discs indicated that all were in excellent shape. Wear? Only .065" – all evenly distributed, and with parallelism perfectly retained.

Regular six-month inspections show a maximum wear of only .0027" per month on the stainless discs. Applied against the available disc wear of .750", this figure actually indicates a *disc life of more than 23 years.*

It's easy to see why. Nickel stainless steels combine exceptionally high resistance to corrosion and erosion with at least four other important characteristics:

- **High strength**
- **Stiffness**
- **Good machinability**
- **Long wearing qualities**

That's why nickel stainless steels are finding such widespread use in mills today. Cast—or machined from plate—the pulp and paper industry has proved them dependable on jobs where many metals simply don't work out.

Have you a problem that a nickel stainless steel casting might solve? You may find the solution in our new free booklet, *Heat Resistant Castings, Corrosion Resistant Castings, Their Engineering Properties & Applications.* Sent without obligation. Just write for "Booklet A-266."

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street INCO New York 5, N.Y.

INCO NICKEL
NICKEL MAKES ALLOYS PERFORM BETTER LONGER

X-Link

FOR SATURATION OF CELLULOSIC AND SYNTHETIC FIBER PAPERS

NEW

SELF-REACTIVE

CROSS-LINKING RESIN LATEX

X-LINK reacts with itself upon drying to form structures with exceptional properties: unusual resistance to heat, water, solvents, chemicals, discoloration; very strong, flexible films. It produces extremely high tensile strengths concurrently with high tear characteristics.

X-LINK is self reactive. A cross-linking acrylic copolymer latex that requires no compounding or formulating. It overcomes problems of stability, odor, high curing temperatures and compatibility encountered with other thermoplastic polymers which require addition of thermosetting type resins for cross-linking.

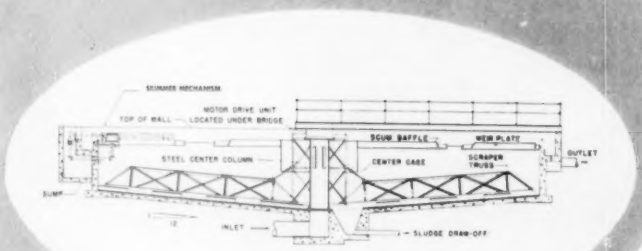
X-LINK is designed for saturation of cellulosic and synthetic fiber papers of all types. Full details are now available. Just write or call your National office.

National RESINS

NATIONAL STARCH and CHEMICAL CORPORATION

750 Third Avenue, New York 17 • 3641 So. Washtenaw Avenue, Chicago 32 • 735 Battery Street, San Francisco 11

Choose the CORRECT WASTE TREATING EQUIPMENT for SUSPENDED SOLIDS REMOVAL



If you require only settleable solids removal you'll do well to consider an INFILCO clarifier for simple gravity settling. Correct hydraulic and mechanical design insures satisfactory performance and minimum maintenance expense.

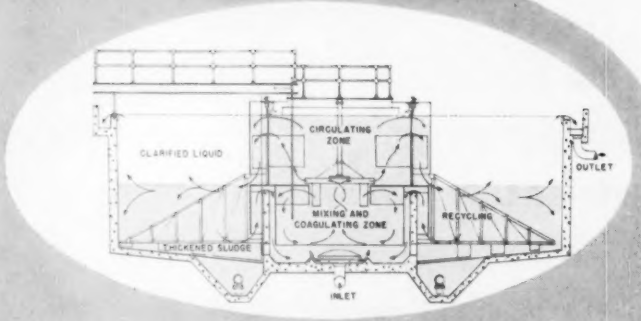
The WS Clarifier mechanism with a central drive shaft supported from stationary beams spanning the tank is available for small and medium diameter units. The BF mechanism with the scraper assembly suspended from a turn-table carried by a central column is preferred for larger size clarifiers.

Surface skimmers are available for floatable solids.

For complete information, send for

Bulletin W-800-D

Minimize your investment by selecting the correct equipment to accomplish the results you want



If pollution control regulations or your plans for water recovery require colloidal as well as settleable solids removal by chemical coagulation, specify the CYCLATOR® clarifier to obtain unique design features which give you maximum clarification.

Untreated waste and chemicals are mixed in the presence of previously precipitated solids which are recirculated from the settling zone. This promotes formation of large dense floc particles which settle rapidly and produce maximum clarification.

Bottom scrapers thicken settled sludge and move it to the discharge sump. Surface skimmers are available for floatable solids.

For more complete information, write for

Bulletin 850-C

INFILCO

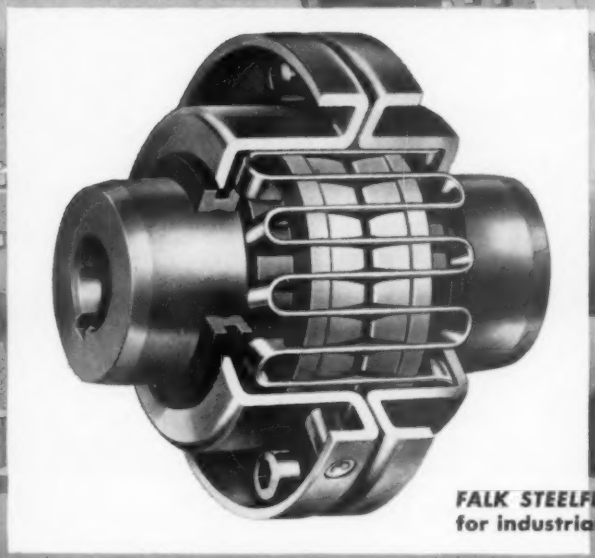
INFILCO Incorporated

General offices • Tucson, Arizona

Field offices throughout the United States and other countries

FALK

A GOOD NAME IN INDUSTRY



FALK STEELFLEX COUPLINGS
for industrial applications...large or small

Giant Falk Coupling smooths out steel blooming mill performance

On a blooming mill at the Copperweld Steel Company plant in Warren, Ohio, installation of a large Falk Steelflex coupling between motor and pinion stand eliminated troublesome noise and vibration which threatened to damage mill machinery. Transmitting 5,000 hp at 50/100 rpm, this is not the largest Falk coupling... others are designed to transmit up to 130,000 hp at 100 rpm.

This installation and others like it prove the Falk concept of shaft coupling design—namely, a modern shaft coupling must contribute to the successful performance of the machinery system.

What does this mean to you? Just this: On large machines as well as small, the exclusive Falk grid-groove design does make a difference, and the difference is torsional resiliency with the strength of steel...reason enough to specify Falk Steelflex couplings as "long life" insurance for your connected machinery.

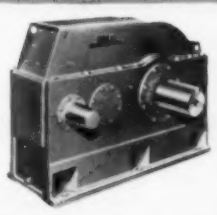
Falk Steelflex couplings are available in standard designs in 34 sizes for applications from .3 hp at 100 rpm to 130,000 hp at 100 rpm, with excellent delivery. Write for Bulletin 4100.

THE FALK CORPORATION, MILWAUKEE 1, WISCONSIN
MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS
Representatives and Distributors in most principal cities

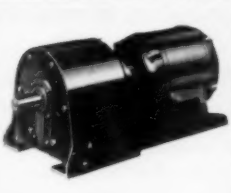
• • •

A Point to Ponder...When you need gear drives or shaft couplings of "FALK OR EQUAL" quality, where but from Falk can you get the "OR EQUAL"?

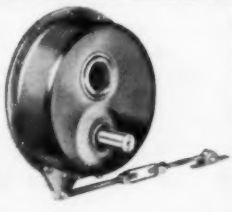
Other members of America's First Family of Power Transmission Products



SPEED REDUCERS
Parallel Shaft up to 3500 hp. Ask for Bulletin 1100. Also Right Angle and Concentric Shaft designs.



ALL-STEEL MOTOREDUCERS
—up to 75 hp. Horizontal, Vertical, and Right Angle. All-Motor and Integral Types. Ask for Bulletin 3100.



SHAFT MOUNTED DRIVES
—up to 125 hp. Ask for Bulletin 7100. Also Flange Mounted and Screw Conveyor Drives.

FALK, STEELFLEX and ALL-MOTOR are registered trademarks

*Idea submitted by Arthur Hanson, Minnesota & Ontario Paper Co., Littlefork, Minnesota

Photo by: Harold M. Lambert

The 40-mile-long Grand Teton range has 11 major **Peaks**, and is the most **Spectacular** portion of the Rocky Mountains in Wyoming.

HAM FELTZ says:

"Reminds me that HAMILTON Felts are a help to peak production, spectacular savings!"

YOU CAN'T BEAT

Hamilton

FELTS

*WIN . . . *A NEW Shakespeare Spincast Fishing Outfit!*

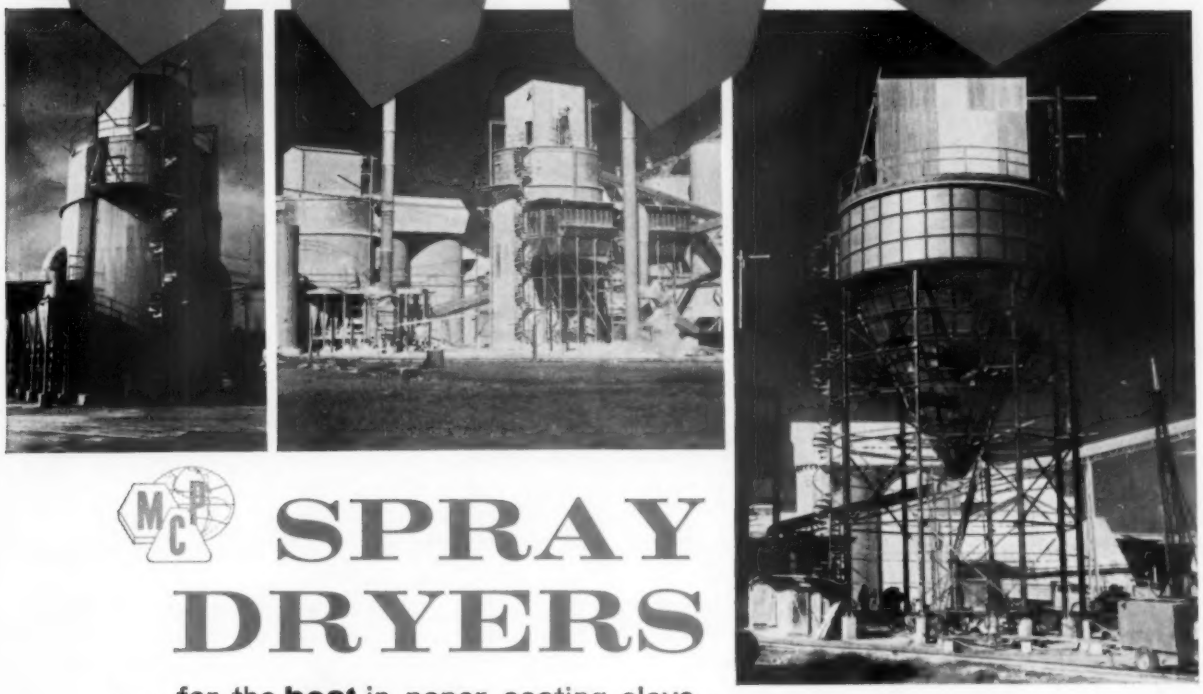
"What famous place reminds you of Hamilton Felts? Tell us why in a few words; sign your name and address and name of company. Each idea from a U.S. papermaker that we use wins a new 1961 model Shakespeare Spincast Rod and Reel—FREE! When identical winning ideas are submitted by 2 or more papermakers, the one with the earliest postmark will be considered the winner. Every U.S. papermaker *entrant* receives a famous Rex Spoon fishing lure — FREE. Send me your suggestion — today.
Ham Feltz, 612 First National Bank Bldg., Dept. PP,
Cincinnati 2, Ohio."

"Hamilton Felts can help *you* realize peak production, spectacular savings and increased profits, because they're 'water-conditioned' — especially designed, carefully woven and porosity proven — for faster water removal, so they'll deliver drier sheets to the driers, permit operators to run machines at higher speeds . . . longer . . . turning out more tonnage, with fewer stops and less broke or imperfections.

"Ask your Hamilton Felts Service Salesman about our 300 proven styles. If one of our 'standard 300' won't solve *your* needs, we will be happy to design a Hamilton Felt that will."

SHULER & BENNINGHOFEN, HAMILTON, OHIO

1 2 3 now 4!



SPRAY DRYERS

. . . for the **best** in paper coating clays

First to spray-dry paper coating clays, MINERALS & CHEMICALS PHILIPP now provides twice the number of spray-drying units of any other coating clay producer.

This is the most precise method used today for drying paper coating clays. Drying is instantaneous, forms microspheroids of clay with a controlled moisture content that can be set as low as ½ of one percent. All four MCP spray dryers are completely instrumented. To the paper maker this means pure, quality-controlled clays of high bulk density, excellent handling properties, and ease of dispersion and make-down. MCP's fourth spray-drying unit offers even greater flexibility to provide a broad range of coating clays to meet individual customer needs.

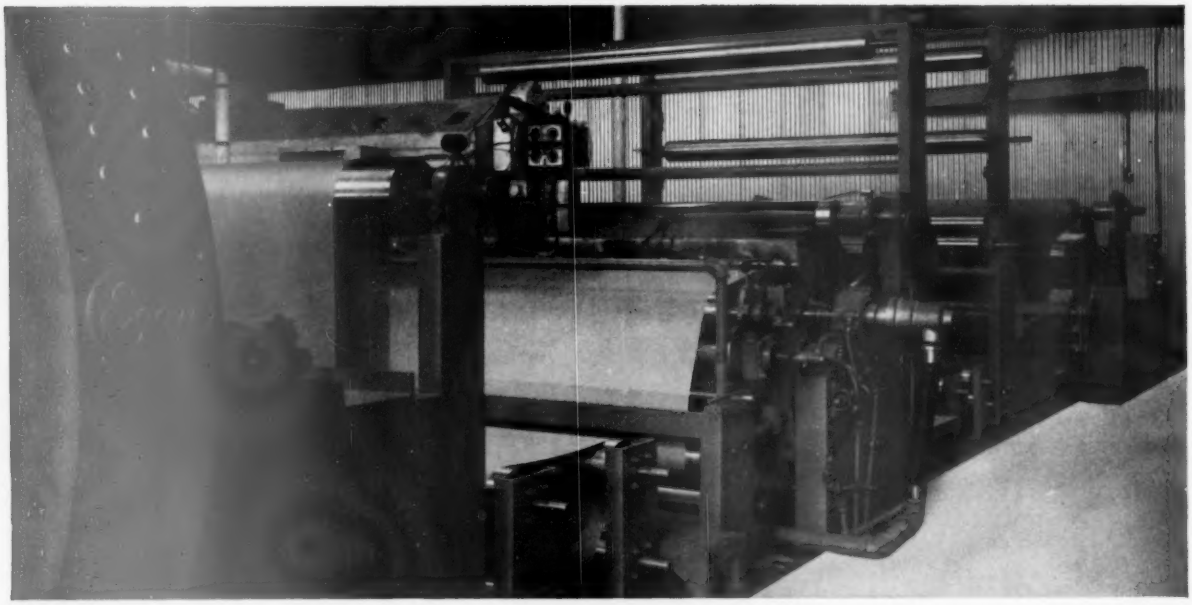
We will be glad to show you what MCP Edgar spray-dried paper coating clays can do for your products. Write, or give us a call.

Edgar

EDGAR PAPER CLAYS from

MINERALS & CHEMICALS PHILIPP
CORPORATION

2233 ESSEX TURNPIKE MENLO PARK, NEW JERSEY



FOR HIGH-SPEED POLYETHYLENE COATING OF WIDE PAPER

CONTINUOUS OPERATION AT 1,000 FPM

When the converting operation calls for polyethylene coating of wide-web kraft and other papers, no production unit can surpass an Egan Extrusion Coater!

The coater illustrated above includes a flying-splice unwind stand, direct electric heat extruder, die, laminator, and single drum surface winder. The combination is capable of continuous operation at 1,000 fpm.

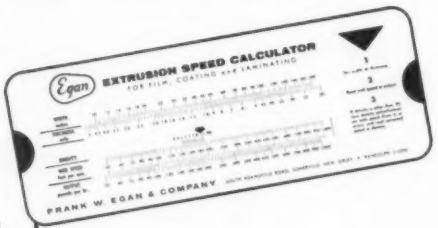
Open construction of the laminating unit permits maximum access and visibility for the operators. The laminator also has controlled stripping tension, and includes *patented* horizontal and vertical adjustments of the laminating nip which are essential for maximum adhesion control.

The cooling roll is of a unique *patented* design. This double spiral roll provides for highly efficient cooling and extremely uniform temperatures across the roll. Use of the double spiral permits water to enter simultaneously from both ends of the roll and exit at opposite ends from the point of entry. The temperature across the entire face of the roll during operation has a differential of no more than 2°F.

Egan production units are available in widths to 120″.

WORLD'S LEADING MANUFACTURER OF EXTRUSION COATERS

WRITE for this handy Egan Extrusion Speed Calculator which quickly determines any extrusion capacity required for a specific web speed, width, and coating thickness.



Egan FRANK W. EGAN & COMPANY
SOMERVILLE, NEW JERSEY

CABLE ADDRESS: EGANCO—SOMERVILLE, NJER

MANUFACTURERS OF PROCESSING MACHINERY FOR PAPER, FILM & FOIL, AIR DRYING SYSTEMS; ROTOGRAVURE PRINTING PRESSES; PLASTICS EXTRUDERS & ACCESSORIES; TEXTILE FINISHING MACHINERY.

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Another Mount Vernon Dryer Felt Success Story . . .

A prominent producer of liner and liner board specialties wanted a felt that would run competitively with full-faced asbestos dryer felts. Mount Vernon engineers recommended RICHLAND 343, a synthetic reinforced cotton dryer felt. Under conditions that normally resulted in around 100 days of dryer felt life, RICHLAND 343 stayed on the job 173 days, giving considerably increased life, lower cost per ton and more efficient drying.

STAMINA FOR GREATER MILEAGE

RICHLAND 343—Synthetic Reinforced Dryer Felt

RICHLAND 343 has the stamina to endure longer runs, to stay on the job longer, steadily resisting deteriorating effects of heat, abrasion and chemicals. Sturdy and tough, RICHLAND 343 also possesses extremely fine drying characteristics. Reinforced with synthetic fibers in the warp and filling, RICHLAND 343 can be counted on to retain its effectiveness longer, to out-stay cotton felts. Stronger and longer-lasting, this dryer felt will bring down the cost per ton of paper made. Sold only pre-stretched and pre-shrunk, available with or without clipper seams.

MOUNT VERNON DRYER FELT FAMILY—RICHLAND 343 is just one of Mount Vernon's full "family" of scientifically designed dryer felts. There's an individual felt for virtually every paper machine position and every paper-making need.

UNIFORMITY Makes The Big Difference

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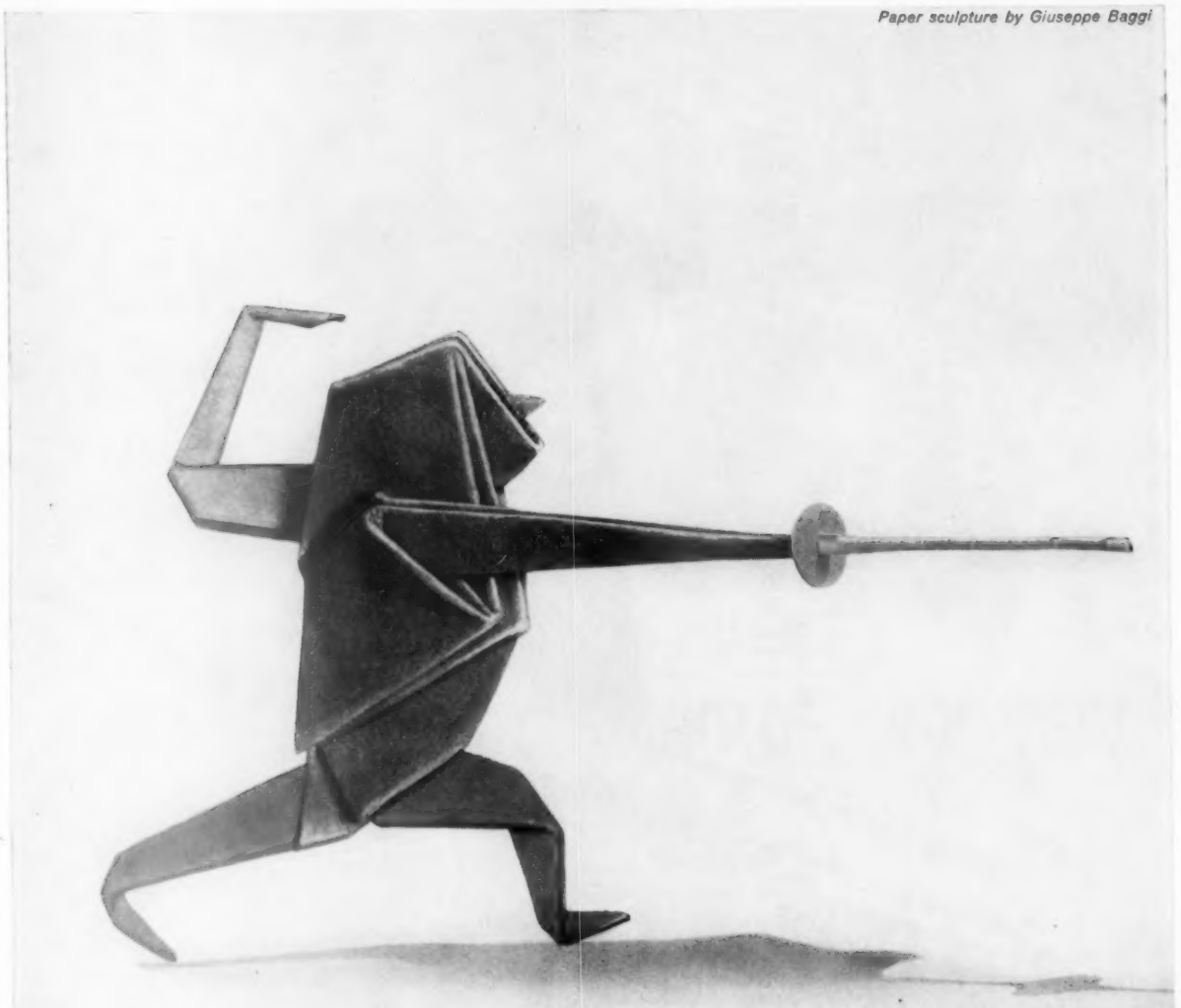
A LEADER IN INDUSTRIAL TEXTILES

DRYER FELT DIVISION, 201 East Baltimore Street, Baltimore 2, Maryland • Telephone: SA 7-5845

Paper sculpture by Giuseppe Baggi



Pulp from ***Gottesman means...***

PERFORMANCE!

Bleached and Unbleached Sulphite • Bleached Hardwood • Groundwood
Bleached, Semi-Bleached, and Unbleached Kraft

GOTTESMAN–CENTRAL NATIONAL ORGANIZATION

WOOD PULP G

PULP PAPER EXPORT CNC

Established 1886

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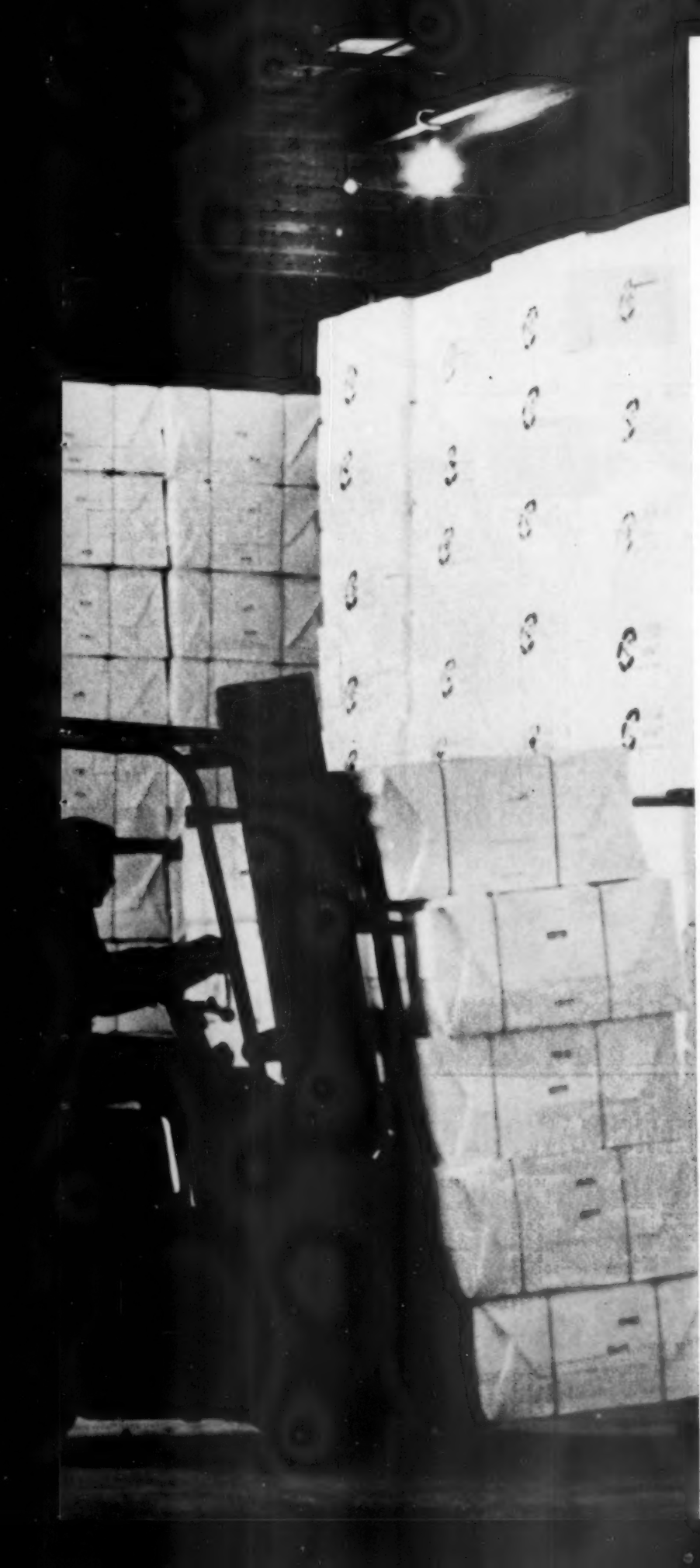
100 Park Avenue, New York 17, N. Y.

Gottesman & Company Aktiebolag, Stockholm, Sweden • Central National-Gottesman Limited, London, England • Representatives in 55 Leading World Markets

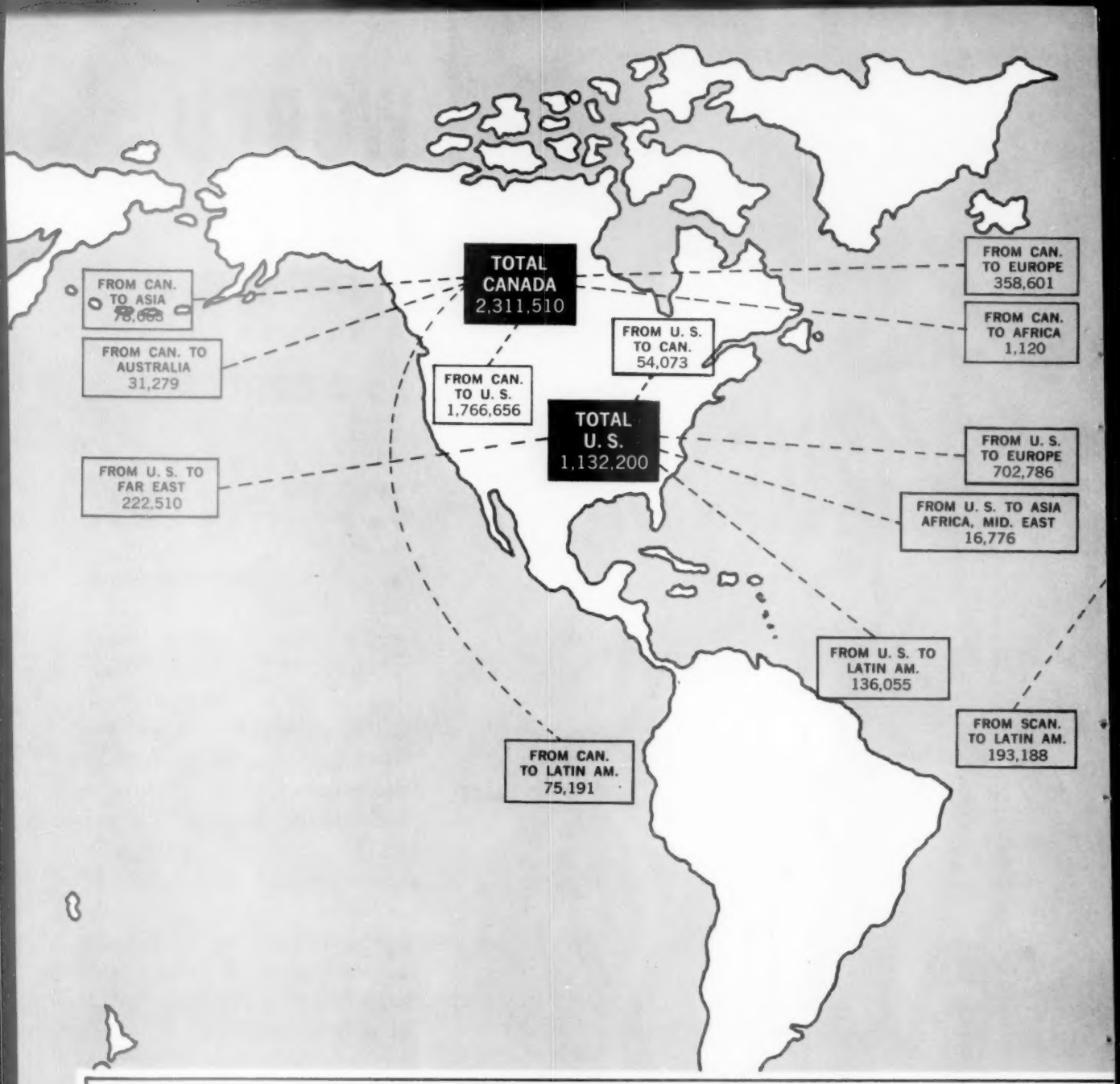


WORLD PULP TRENDS

. . . contents

Summary of major trends and developments in 1960, 1961 and future years in woodpulp commerce (p. 68) . . . Map of world flow of chemical woodpulp shipments (p. 66) . . . Leading pulp exporting nations (p. 70) . . . A penetrating study of European situation—durability of its paper industries, tendency in Scandinavia to more conversion, steady Russian markets—by Jacques Tasiaux (p. 71) . . . The dissolving pulp picture—world trade now of paramount importance, U.S.A. and Scandinavia each sell to 29 nations, tire cord "battle"—by Rex Vincent (p. 73) . . . A comprehensive analysis of world pulp resources and trends in pulp manufacturing, utilizing wood, straw, bamboo, bagasse and other fibrous materials—by Frank Peterson (p. 76) . . .

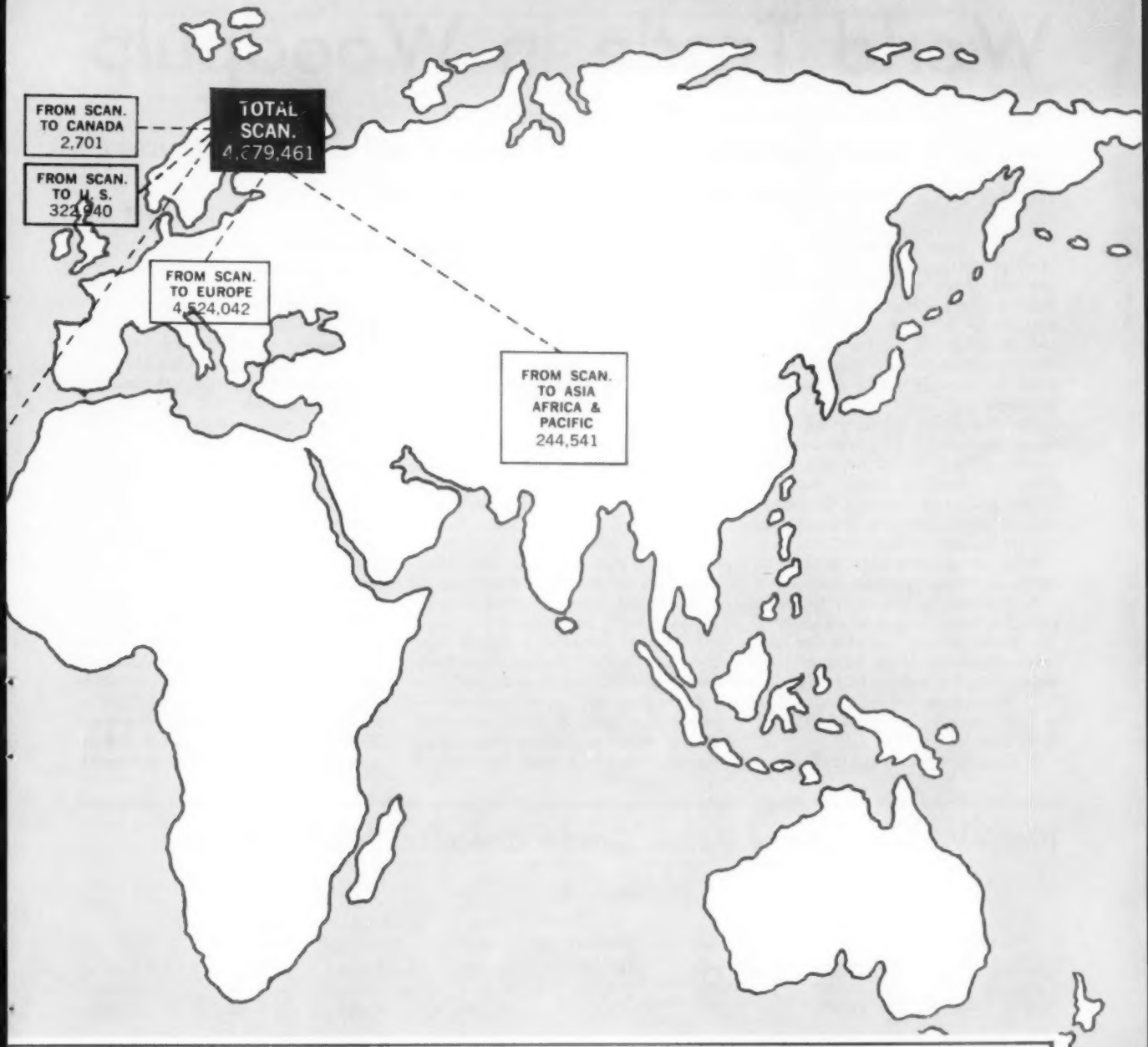
World Market Pulp Directory —grades (p. 83), producers (p. 88), cross index of North American agents and importers by companies (p. 104), list of North American agents and importers (p. 108), U.S. rayon acetate producers (p. 114)


TOTAL CANADA 2,311,510
FROM CAN. TO EUROPE 358,601
FROM CAN. TO ASIA 78,693
FROM CAN. TO AFRICA 1,120
FROM CAN. TO AUSTRALIA 31,279
FROM U. S. TO CAN. 54,073
FROM CAN. TO U. S. 1,766,656
TOTAL U. S. 1,132,200
FROM U. S. TO EUROPE 702,786
FROM U. S. TO FAR EAST 222,510
FROM U. S. TO ASIA AFRICA, MID. EAST 16,776
FROM U. S. TO LATIN AM. 136,055
FROM SCAN. TO LATIN AM. 193,188
FROM CAN. TO LATIN AM. 75,191

WORLD FLOW OF CHEMICAL WOODPULP SHIPMENTS

(In Short Tons)	1960	1959
U.S.A. TOTAL	**1,132,200**	**652,437**
To Canada	**54,073**	**56,833**
To Latin America	**136,055**	**112,596**
Argentina	17,858	4,849
Brazil	13,779	2,068
Chile	5,884	9,331
Colombia	13,932	18,713
Cuba	33,291	31,640
Mexico	22,091	19,984
Peru	5,482	2,671
Uruguay	6,131	1,780
Venezuela	17,042	21,115
To Europe	**702,786**	**390,751**
Austria	2,555	1,283
Belgium	25,723	14,941
France	72,715	38,030
West Germany	141,774	94,126
Greece	2,728	
Ireland (Eire)	4,887	1,390
Italy	82,614	41,695
Netherlands	50,353	23,209
Poland	6,161	
Portugal	4,079	
Spain	6,905	2,756
Sweden	6,063	4,588
Switzerland	8,388	6,527
United Kingdom	284,042	161,536
Yugoslavia	1,276	287
To Asia, Africa and Middle East	**16,776**	**11,398**
India and Pakistan	7,812	6,964
Israel	3,026	623
South Africa	4,938	990
To Far East	**222,510**	**80,859**
Australia	29,324	11,872
Formosa	3,777	3,755
Japan	150,232	46,415
Korea	14,862	5,905
Philippines	21,521	13,287
Tasmania	2,240	

	1960	1959
CANADA TOTAL	**2,311,510**	**2,199,975**
To Europe	**358,601**	**255,034**
United Kingdom	230,292	175,746
Belgium & Luxemburg	6,416	6,667
France	31,520	18,029
West Germany	53,338	29,465
Ireland (Eire)	1,308	454
Italy	16,717	12,594
Netherlands	8,323	8,148
Switzerland	3,995	2,685
Poland	2,203	
To Latin America	**75,191**	**62,922**
Argentina	8,379	3,363
Chile	571	13,881
Colombia	19,720	18,954
Peru	8,179	4,136
Uruguay	1,741	503
Venezuela	6,079	16,184
Brazil	12,068	


FROM SCAN. TO CANADA 2,701
TOTAL SCAN. 4,679,461
FROM SCAN. TO U. S. 322,940
FROM SCAN. TO EUROPE 4,524,042
FROM SCAN. TO ASIA AFRICA & PACIFIC 244,541

By Sandinavian and North American producers
Map shows 1960 statistics—below is comparison with 1959

Copyright 1961 by PULP & PAPER

	1960	1959
Cuba	8,782	22
Mexico	9,108	5,329
To Oceania	**31,279**	**13,411**
Australia	31,279	13,411
To Asia	**78,663**	**108,387**
India	27,900	23,123
Pakistan	2,239	5,601
Japan	19,999	47,301
Korea	3,377	7,358
Philippines	7,210	15,197
Taiwan	9,660	8,045
Israel	2,393	
Egypt	220	1,650
Indonesia	878	
Turkey	379	
Hong Kong	4,408	
To Africa	**1,120**	**735**
Union of South Africa	1,065	735
Rhodesia and Nyasaland	55	

	1960	1959
SCANDINAVIA TOTAL	**4,679,461**	**4,346,977**
To U.S.A.	**322,940**	**415,031**
To Latin America	**193,188**	**209,096**
Argentina	81,831	113,285
Brazil	73,742	110,982
Chile	6,887	15,087
Mexico	16,689	11,079
Uruguay	17,749	16,693
Cuba	5,283	4,061
Venezuela	7,263	11,211
To Europe	**4,524,042**	**4,706,318**
United Kingdom	1,419,312	1,259,762
Ireland (Eire)	27,513	28,801
Netherlands	279,529	247,657
Czechoslovakia	21,015	20,389
Belgium	154,020	145,835
Greece	45,962	43,266

	1960	1959
France	513,704	456,463
East Germany	25,047	32,522
West Germany	546,177	497,134
Spain	92,868	53,657
Switzerland	70,037	53,671
Portugal	24,313	17,052
Italy	361,474	300,666
Poland	77,935	61,357
Hungary	19,509	17,403
U.S.S.R. (Russia)	80,745	68,516
To Asia, Africa & Pacific	**244,541**	**194,064**
Australia	79,656	73,794
China	44,492	7,779
India & Pakistan	46,478	56,261
New Zealand	12,166	10,318
Israel	6,858	8,368
Japan	5,802	7,440
South Africa	12,730	11,333

World Trade in Woodpulp

continues strong despite new thrusts toward self-sufficiency. Europe's trade blocs raise issue of pulp vs. paper exports

By A.W.W.

WOODPULP—dissolving and paper grade—is truly a major commodity today on the world's tradeways. It will continue to be so, even though many nations are beginning (or increasing) the production of their own raw material for a wide range of cellulose products.

For the pulps which crossed national frontiers at least one and one-quarter billion dollars, or its equivalent, is changing hands annually. These pulps are crossing the seven seas, in many directions, to reach consumers in more than 40 nations.

Here are major trends or developments in woodpulp commerce:

1. Scandinavia continues to dominate this trade in nearly all parts of the world except America, its seaborne shipments of all kinds of pulp being over five million tons annually. Its 1961 exports will be greater than in 1960, perhaps by around 200,000 short tons.

2. Canadians are exporting about half as much pulp, of all grades, as the Scandinavians (Canada—2,605,800 short tons in 1960, of this 308,785 is dissolving and 238,105 tons groundwood). In chemical paper grades, U.S.A. exports were greater than those of Canada in 1960 but are falling slightly behind this year.

3. The U.S.A. made a leap from 503,000 short tons in 1958 and 652,000 in 1959 to 1,132,000 short tons in 1960 in exports of all pulp grades. About half was in paper grades and nearly all chemical pulps. However, in 1961 and again in 1962, U.S.A. exports may not hit that record again. But each year's exports will hover very close to one million short tons.

4. Delicate issues affecting the pulp vis-à-vis paper exporters of Scandinavia, North America and Austria have developed as the European Free Trade Association (Britain, Scandinavia, Austria, Portugal and Switzerland) accelerated its program of tariff reductions among member countries. Scandinavia and Austria benefit by reduced British paper duties. So, the American paper industry appeals to its government for equal treatment. British papermakers are alarmed by loss of protection. But they do have a "hidden weapon"—the more paper imported, the less pulp they will buy from Americans, Canadians, Scandinavians and Austrians—in fact, they could cut off some pulp orders as retaliation (the same companies often export both pulp and paper). A sidelight on this is that U.S. government assistance has helped greatly to build up the competitive Finnish and Austrian pulp-paper industries. (Finland recently was admitted to EFTA to a limited degree.)

5. Similar problems affect the Common Market (France, W. Germany, Italy and Benelux) vis-à-vis EFTA. Governments are pushing ahead, with popular support to merge the Common Market (EEC) and EFTA, thus forming a more powerful European trade bloc that could match in bargaining power the Russian and Ameri-

1960 World Flow of Paper Grade Chemical Market Pulp

(in thousands of 2,000 lb. tons)

Purchaser	*From U.S.A.*	*From Canada*	*From Sweden*	*From Finland*	*From Norway*	*From Austria*	*Total*
United States	1,114,500	950,800	188,600	110,300	15,300	—0—	2,379,500
Canada	42,900	230,200	2,700	—0—	—0—	—0—	275,800
Other America	97,900	73,700	71,300	88,500	6,500	—0—	337,900
Total America	1,255,300	1,254,700	262,600	198,800	21,800	—0—	2,993,200
United Kingdom	226,300	210,000	633,300	458,700	85,700	—0—	1,614,000
West Germany	98,600	52,800	340,600	109,100	20,700	34,300	656,100
France	43,900	29,200	253,900	159,100	18,300	4,100	508,500
Italy	60,100	15,800	160,500	74,900	7,800	97,300	416,400
Netherlands	26,100	8,300	84,300	115,600	26,800	—0—	261,100
Other Europe	49,100	14,900	569,300[1]	294,300[2]	114,100[3]	95,300[4]	1,167,000
Total Europe	504,100	331,000	2,041,900	1,211,700	303,400	231,000	4,623,100
Rest of World	73,400	71,000	91,800	87,400	12,100	—0—	335,700
Total World	1,832,800	1,656,700	2,396,300	1,497,900	337,300	231,000	7,952,000

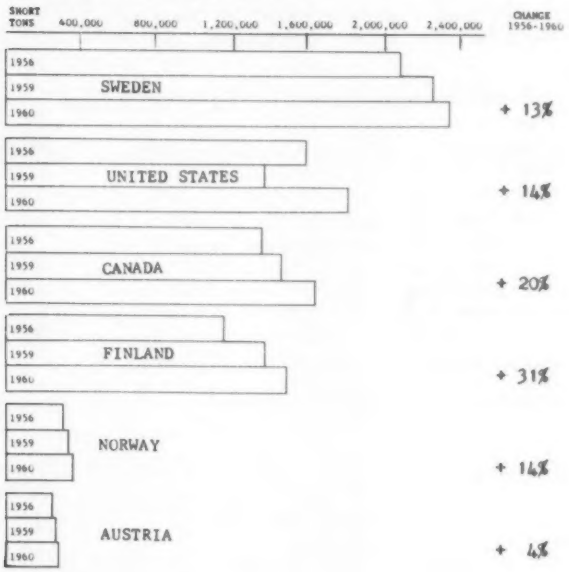
—Compiled by Association of Pulp Consumers, Inc.

[1]Includes 252,163 tons sold to Swedish consumers.
[2]Includes 126,823 tons sold to Finnish consumers.
[3]Includes 124,094 tons sold to Norwegian consumers.
[4]Includes 62,718 tons sold to Austrian consumers.

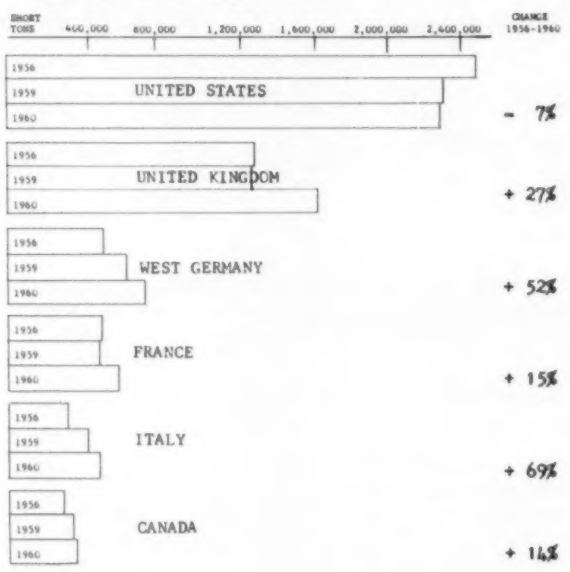
Paper Grade Market Chemical Pulp—1956-1959-1960

(All figures include both domestic and export shipments and purchases)

Principal Shipping Nations



Principal Purchasing Nations



World Shipments

(in thousands of short tons)

Principal Producing Nations	1956 Tons	1956 % of Total	1959 Tons	1959 % of Total	1960 Tons	1960 % of Total
United States	1,603	24	1,393	20	1,833	23
Canada	1,385	20	1,460	21	1,657	21
Sweden	2,125	31	2,288	32	2,396	30
Finland	1,146	17	1,385	20	1,498	19
Norway	295	4	315	4	337	4
Austria	223	3	230	3	231	3
Total	6,777		7,071		7,952	
North America	2,988	44	2,853	40	3,490	44
Europe	3,789	56	4,218	60	4,462	56

—Compiled by Association of Pulp Consumers, Inc.

World Purchases

(in thousands of short tons)

Consuming Nation	1956 Tons	1956 % of Total	1959 Tons	1959 % of Total	1960 Tons	1960 % of Total
United States	2,553	38	2,380	34	2,379	30
Canada	241	4	268	4	276	3
Other America	403	6	387	5	338	4
Total America	3,197	47	3,035	43	2,993	38
United Kingdom	1,274	19	1,270	18	1,614	20
West Germany	432	6	555	8	656	8
France	443	6	425	6	509	6
Italy	246	4	350	5	416	5
Netherlands	126	2	227	3	261	3
Other Europe	464	7	961	14	1,167	15
Total Europe	2,985	44	3,788	54	4,623	58
Rest of World	595	9	248	3	336	4
Total World	6,777		7,071		7,952	

can industries. Some Common Market members, however, already are alarmed by rising Scandinavian paper imports and worry about Scandinavian, Austrian and British paper competition in a united European trade association. Here again, Scandinavian pulp might have to pay a penalty.

6. Russian exports probably will continue for a number of years as a minor market factor, ranging from 200,000 to 300,000 tons (257,000 in 1960), and with customers now regarded as steady in Britain, France, Belgium and a few Communist countries. Its pulp imports from Scandinavia some years may practically equal exports. For politico-economic competitive reasons, Russian prices could be upsetting to Western producers in certain restricted markets at any time. However, pulpmakers see similar potential threats from other nations, too.

7. This year about 700,000 tons of additional market pulp capacity is coming into production in Canada and Scandinavia—about an equal amount in each area. Next year the increased capacity will be about 800,000 tons. It is quite certain the world will have enough pulp for a while longer. Overcapacity continues in the United States; fortunately for American producers, their markets abroad continue almost as strong as a year ago.

8. Europe is now far ahead of America as the world's biggest market for woodpulp. Of all pulp grades, Europe is buying about 50% more than North and South American nations combined. No experienced pulp marketers expected Europe to continue to increase its consumption at such fantastic rates as last year—12 to 14% in many countries—but prosperity still continues in Europe at a high level.

9. Among individual nations, the United States is still far ahead of all

Trends in 1961–Paper Grade Market Chemical Pulps

World Shipments

(in thousands of short tons)

Principal Producers	First Three Months 1961	1960	Change in 1961
United States	457.3	445.2	+ 2.7%
Canada	495.4	437.4	+13.3%
Sweden	570.7	539.3	+ 5.8%
Finland	351.4	369.5	— 4.9%
Norway	82.2	91.0	— 9.7%
Total	1,957.0	1,882.4	+ 4.0%

(Includes both domestic and export sales)

World Purchases

(in thousands of short tons)

	First Three Months 1961	1960	Change in 1961
United Kingdom	382.2	361.2	+ 5.8%
West Germany	150.4	146.5	+ 2.7%
France	145.9	115.8	+26.0%
Italy	88.5	65.0	+36.2%
Netherlands	61.4	70.2	—12.5%
Other Europe*	275.7	258.9	+ 6.5%
Total Europe	1,104.1	1,017.6	+ 8.5%
Total America	709.7	739.1	— 4.0%
Rest of World	66.2	70.9	— 6.6%
Total World	1,880.0	1,827.6	+ 2.9%

*Includes domestic sales in Sweden, Finland and Norway

others in purchases of pulp. About half of its purchased pulp is from U.S. producers. But U.S. purchases have declined, as mergers and integration of paper and pulp mills continue.

10. The United Kingdom stands far ahead of all other nations as a purchaser of imported pulps (it bought 1,614,000 tons of paper chemical pulps in 1960, an increase of 340,000 tons over 1959). The United States is next (1,265,000); followed by West Germany (656,000), France (509,000) and Italy (416,000). Imports of dissolving pulp and groundwood are not included in these figures; they raised the British figure substantially, and, to a lesser degree, other European totals.

11. Considering paper chemical pulps only, the Association of Pulp Consumers Inc. reported that nearly 8,000,000 short tons crossed international borders in 1960. The European producers' share in this declined from 60 to 56% in 1960, but probably will climb again this year. North America's share, which rose 40 to 44% last year, is likely to decline slightly. Last year Sweden produced 30% of world shipments of paper chemical pulps, U.S.A., 23%, Canada, 21%, Finland, 19%, Norway, 4%, and Austria, 3%. This does not include exports of mechanical pulp, relatively large from Norway, for example, but only a minor item in U.S.A. or Sweden's trade.

12. Important news this year were upward revisions of expansion programs of Sweden and Finland. Swedish associations reported another new survey of resources will permit an increase in capacity of 1.5 million tons by the end of 1964–bringing the nation's cellulose capacity to 5.5 million tons, semi-chemical to 100,000 and mechanical pulp to 1.5 million. Of this about 950,000 is currently earmarked for market pulp, the rest for conversion, but market conditions could alter the proportions. In Finland, plans for market pulp expansion are about the same. Norway's growth is slower, except for the projected joint Finnish-Norwegian mill at Kirkenes, Norway's Arctic Ocean seaport.

Ranking of World Pulp Exporters

In world pulp trade, the "Big Three" which generally come to mind are Scandinavia (as a group), the United States and Canada. But there are others who participate to a lesser degree.

Russia has what appears to be a steady, though still minor, market. Austria, its industries revived by the Marshall Plan, now ranks close to Norway in exports. Czechoslovakia and Poland are potentially future secondary pulp exporters but none was exported last year by either. Portugal for many years has been exporting bleached eucalyptus pulp. New Zealand has become a major supplier of Australia. Switzerland has market sulfite mills, serving Swiss mills.

Here are 1960 figures for woodpulp exports from a number of countries (data supplied by our national editors in these countries, generally from their local associations or government sources):

Woodpulp Exports—all grades—1960

(in short tons)

1.	Sweden	3,229,000
2.	Canada	2,605,799
3.	Finland	1,758,000
4.	United States	1,132,000
5.	Norway	881,730
6.	Russia	257,000
7.	Austria	226,174
8.	West Germany	107,955
9.	France	79,500
10.	New Zealand	78,483
11.	Portugal	40,000
12.	Yugoslavia	30,000
13.	Japan	23,025
14.	Switzerland	14,893
15.	Italy	11,964
16.	Belgium	5,000

Relative Importance of North American and Scandinavian Supply Sources for Market Dissolving and Special Alpha Pulps

	1959	1960
U.S.A.	52%	52%
Canada	12%	9%
Total North America	64%	61%
Sweden	20%	22%
Finland	9%	9%
Norway	7%	8%
Total Scandinavia	36%	39%

EXCLUSIVE—AN ANALYSIS OF EUROPEAN PULP SUPPLY

Pulp and Paper for Europe —Now and in Future Years.

A "fundamental tendency" in Scandinavia is toward pulp conversion but Continental paper industry has defenses . . . Russia will be a factor

By JACQUES TASIAUX
General Manager, Continental Cellulose S.A.

—Brussels

THE CONSUMPTION of paper in Western Europe has been increasing at an average rate of about 4.5% per year. This consumption is now about 135 lbs. per capita per year in most of the European Economic Community (Common Market), as against over 400 in U.S.A. It is generally expected that the standard of living will increase in an accelerate pace with the progressive disappearing of the commercial tariffs within the EEC. It is well-known that paper consumption increases faster than the standard of living.

This explains why we are optimistic as to the future of the paper in the Common Market. Whereas the standard of living in North America is 1.5 to 2 times higher than in Western Europe, consumption of paper is over three times higher.

The future of woodpulp is bound with the future of paper mills in the Common Market countries (France, West Germany, Italy, Holland, Belgium and Luxembourg). There is in Northern Europe (Scandinavia) a fundamental tendency to process the wood to its final stage of paper instead of pulp. This tendency applies mostly on "bulk" papers such as newsprint, kraft paper and to some extent to paperboard and greaseproof paper, and also some kinds of fine papers.

MR. TASIAUX is associated with his father, Franz Tasiaux, and his brother, Philippe, as a representative over most of Continental Europe for both North American and Scandinavian pulps. In this penetrating study, he indicates where Europe will get its pulp, its paper and even its pulpwood in the short and long term future.

This tendency is a very long term one but can be accelerated by the European Free Trade Association, as regards the export of paper from Scandinavia to the United Kingdom, and to a lesser extent to Denmark, Switzerland, Portugal, other nations belonging to EFTA. It should normally accelerate even faster should EFTA merge with the Common Market, which is scheduled to have a protecting custom rate averaging about 18% on imported paper, as against a theoretical 6% on pulp, not in force so far.

Advantages for EEC Paper Mills

The paper industry in the Common Market is partly protected by the custom rates, and also by following facts:

1. Under present conditions, Northern European papermakers can hardly compete with success in fields where the local papermakers have their traditional customers, their skill based upon decades of industrial experience, their cheaper labor, their better adaptation to the size of orders and in general all advantages of being located near and being in closer daily contacts with buyers.

2. The large supply of waste paper in the six countries of the Common Market secures a permanent basis for the local paperboard industry, and to some extent of paper, in this market.

3. Local sources of wood within the Common Market, together with growing use of local hardwood in pulp has led to the building of a local pulp industry, which generally supplies the papermakers at lower prices than the Northern pulpmakers. Many pulp mills have been built or are being built in the Common Market, most of them integrated, with the result that in some countries (e.g., in France), the local production of pulp is now larger than the imports.

This, however, does not solve the supply problem of the non-integrated paper mills, which must buy their pulp from overseas suppliers.

Northern Paper—Export Prospects

It, however, remains that a large gap exists between the competitive power of the paper industry in the Common Market and the possibilities of hardy salesmanship from the Northern papermakers in case EFTA and the Common Market should merge without longterm safety clauses protecting the paper manufacturers of the Common Market against being flooded with Northern papers.

To this, the Northern European papermakers make this reply:

1. They are increasing not only their capacity in papermaking but also their capacity in pulpmaking for market pulp for export.

2. They cannot overnight switch from pulp to paper, nor suddenly leave their pulp customers, nor build up from scratch brand new large markets for paper.

3. They are already short of labor so many of them find it more interesting to export semi-finished products such as pulp. Paper needs to be prepared in definite reel dimensions and even in reams, which involves additional labor not always easy to secure, especially in remote areas.

4. They consider that the availability of capital is limited and already hinders normal projects of development.

Should the Northern European papermakers, with or without help of foreign capital, develop their investments so as to allow an increase of paper production substantially higher than 4.5% per year, this would normally take place in the field of high yield paper machines producing

mostly paper in reels, such as newsprint and kraft paper.

If so, it may be expected that in the Common Market the papermakers who manufacture newsprint and kraft paper with imported raw materials would then look to manufacturing other products less affected by the Northern European competition.

This, in turn, would eventually affect all the various sectors of the paper industry, as there would be a cumulated pressure from the machines 20-30 inches wide on the machines 12-20 inches wide, and from the machines 12-20 inches wide on the machines under 12 inches wide. So the whole industry would be affected and the local advantages of tradition, skill, specialization, cheaper labor and availability of waste paper are not likely to compensate for such chain-reaction.

We think this is not an imaginary threat. We can very well see from the present situation with the non-integrated kraft paper mills in France that, as soon as the export price level of the Northern kraft paper manufacturers is not maintained, the French manufacturers of kraft paper will seriously survey the possibilities for manufacturing other papers, which so far are not considered so sensitive to the Northern European competition.

Pulp Supply for Europe

Another result of the fundamental tendency toward manufacturing paper in Northern Europe is that the development of pulpmaking capacity does not follow the consumption of pulp in West Europe. This is partly matched by the increasing capacity of pulpmaking in the Common Market, thanks to the growing use of hardwood pulps. This, however, by no means covers the growing need for pulp. The result is that the Common Market imports increasing quantities from North America and U.S.S.R.

Aside from spotlots imported by the Common Market countries from the North American continent during the Korean boom, the sales of North American pulps really started expanding from 1954 on. In 1954, it so happened that the North American pulp industry was in a recession whereas the European pulp industry increased its purchases. This sparked a new era which is in normal relation with conditions.

We, as pulp agents selling in most territories of the European Common Market, see possibilities of two serious mistakes by North American pulp producers:

1. The first is that they may consider the Common Market with the same mentality in which one looks at the North American market, where there is only one large single market for pulp, with relatively few sellers and few buyers, and where the integrated pulp and paper mills are by far the overwhelming majority in the paper production.

In the Common Market, we have not only pulps imported from Northern Europe, Canada and U.S.A. and pulps produced locally, but also pulps from Austria, Switzerland, Portugal, French Morocco as well as from U.S.S.R. and Czechoslovakia.

U.S.S.R. has become a regular supplier to France, the United Kingdom, Belgium and other countries. There is no dumping from the Soviet side. The prices are normal considering the necessity to take minimum cargoes, the absence of regular shipping lines and discharging conditions. The quality of the pulps is regular and good, and long-term contracts have been closed for up to five years, being carried on at the mutual satisfaction of the concerned parties.

2. The second tendency is for North American suppliers to stick to their official prices whatever quantities are concerned, but when they decide to reduce prices, they will suddenly drop their official prices by too big an amount, treating in the same way large regular buyers and some occasional spot 20-tons buyers.

It seems, indeed, that the North American suppliers do not always accord their local agents the same fruitful confidence that the Northern European sellers grant them when they deserve it.

Short Term Aspects

As regards prices of pulp on the Common Market, the recession which started in early 1957 was at its lowest during the first quarter 1959.

The revival of papermaking activity during 1959 brought a recovery in pulp prices, more in relation with the manufacturing costs in Northern Europe, although not satisfactory to the Northern European pulpmakers. This accelerates their tendency to process their pulp into paper.

However, since 1954 the pulpmaking capacity in North America has remained in advance of consumption regardless of increases in the latter.

From February to May 1960, all kinds of pulps, starting with unbleached kraft and ending with dissolving pulps, were quoted with a price increase of Swedish Crowns 30.- or $5.80 per air dry metric ton.

In December, it being acknowledged that the bleached pulps were still in excess, there was no increase in price for bleached pulps, whereas the Northern European sellers increased their prices for unbleached sulfite and unbleached kraft by a second Swedish Crowns 30.- or $5.80 per air dry metric ton.

The stability of the pulp market during 1961 and 1962 will depend upon:

1. Keeping up of the backlog of orders in paper at the paper mills,

2. The behavior of the pulp producers who, in Northern Europe or in America, might not wish to keep the price levels.

On a long-term basis, the structural views outlined above can explain that one can all in all be optimistic on the future of the pulp market.

Pulpwood for Common Market

The tendency of the Common Market to buy not only from the Northern European countries but also from North America may become even more evident for pulpwood than it is for pulp.

Pulpwood—spruce—is imported by Common Market integrated mills for manufacturing sulfite pulp and mostly groundwood. The wood is bought mostly from Finland and U.S.S.R., also from Poland, and also from local suppliers. The pulpwood for kraft or sulfate pulp—pine—is also partly imported, but to much less extent, thanks to local production.

There seems now to be a limit to the possibilities of purchasing spruce pulpwood from Finland and U.S.S.R. who process it more and more by themselves.

Canada is known to have unlimited possibilities for export of pulpwood, mostly spruce mixed with balsam fir.

For the paper industries of the Common Market who themselves manufacture sulfite pulp and groundwood they use and who can stand the competition in paper, we must expect increasing imports of Canadian pulpwood.

The buyers of pulpwood in the Common Market expect their Canadian suppliers will progressively, despite local difficulties, supply higher proportions of spruce, up to 100%, with a minimum or no percentage at all of balsam fir, for which the costs of cutting and transportation are really not worthwhile.

This problem of the balsam fir proportion has been for years a great hindrance to imports of pulpwood from Canada.

The other minor disadvantages such as length of the logs and definition of the allowances could probably easily be overcome.

EXCLUSIVE ANALYSIS OF PURIFIED WOOD CELLULOSE TRENDS

World Trade in Dissolving Pulp Is Major Factor in '60-'61 Status

By REX VINCENT
Vice President and Technical Director, Bulkley, Dunton Pulp Co.

MR. VINCENT: ". . . . there is no longer a domestic (U.S.) industry and in future exports will, in large measure, control . . .".

—New York

AT FIRST THOUGHT it might seem ridiculous to begin an article on dissolving pulp by talking about gold, but gold and its movements was one of the most important economic subjects of 1960. For the first time in its recent history the United States was faced with the probability of losing its position as the world's clearing house and having its currency sold at a discount. For the first time its diplomats were out seeking help on the problem of losing gold as debts and clearances were settled in gold instead of currency.

All America was exhorted to export, to increase the goods flowing overseas so that more dollars would return and thus reduce the claims against our gold. A great deal of talk and emphasis on exports, but how much real help came from the government? How much assistance to enable Americans to compete? Any bilateral clearing treaties; No. Any insurance that an exporter could afford and still remain competitive? No. Any assistance on overall freight rates? No. Any subsidies to offset increasing dollar costs? No. Any government action to prevent labor unions from pricing the finished product out of competition, No. Only exhortation

But, through all this, in 1960 exports came into recognition in a nation that has always shrugged them off as a nuisance and devoted its attention to imports and their restriction so that American industry could grow.

Reviewing this field last year, emphasis was placed on exports and their importance to American producers was remarked upon again and again. The activity during the year bore out these remarks as in that year U. S. exports rose to an all time peak and 37% (415,000 short tons) of United States dissolving pulp production went overseas. Some years ago it was pointed out here that U. S. dissolving pulp industry was becoming a world business because 25% of its business was in foreign markets. That trend has continued and grown until now the export segment of the business is almost as important as the domestic segment.

In a few years it will be more important and whereas now the industry could not profitably operate without it, in time it will be completely dependent upon the export trade. It is a very wonderful coincidence for U. S. producers that this export trade has been increasing, because during the same period domestic consumption has been decreasing and for some time, in the recent past, capacity kept going up too.

1960 Operating Capacity Stable

The capacity to produce these pulps has remained fairly stable for the past several years and is now, in round numbers, about 2,000,000 short tons per year in North America. This is not a particularly good figure because any dissolving pulp mill can make paperpulp and is making paperpulp all the time. The U. S. Pulp Producers Assn. accepts a capacity in the United States of about 1,600,000 tons and on this basis these mills operated at 71% of capacity in 1960.

This is not exactly correct either, because there are some straight paperpulp mills that occasionally make grades of pulp that fall into the statistical category of special alpha pulps and these, of course, are placed against the "special alpha" capacity. For all practical purposes two producers have withdrawn from genuine dissolving pulp production and are now producing only the special alpha grades. They are no longer listed as dissolving pulp producers and there is a good probability that the capacity figure given above will be the all-time high for this industry.

As exports become more and more the essential part of the business, those mills that are located so far from tidewater that they have to pay high inland freights will gradually discontinue their production and eventually that capacity will have to be totally withdrawn. In fact, there probably will not ever be built another sulfite dissolving pulp mill in North America and the odds favor no more sulfate dissolving pulp mills.

The cellulose polymer seems to have reached the end of the road. In the past five years there have been no new developments except improvements in present products necessitated by synthetic competition. It would appear that whatever the cellulosics can do the synthetics can do better and in some cases cheaper. The present capacity for dissolving pulp is in the following mills.

Company	*No. of mills*
Rayonier Inc.	*6
Weyerhaeuser Co.	1
International Paper Co.	1
Buckeye Cellulose Corp.	2
Ketchikan Pulp Co.	1
Canadian International Paper Co.	3
Columbia Cellulose Co., Ltd.	1
Alaska Lumber and Pulp Co.	1

* Includes two at one location —Jesup, Ga.

World Production and Trade

Since so much of this pulp is going overseas it becomes necessary to look at overseas production and capacity. This is no longer a domestic industry and in the future the export side will, in a large measure, control the domestic side in prices, policy and research. It stands to reason that future work in these grades will be aimed at the problems of rayon and acetate producers overseas, for that is where the growth factor of this business lies.

In 1960 the major producing countries of the world produced 2,259,000 tons and of this North America produced 1,463,000 tons, still better than 50% but slipping from what it used

to be. These figures show a slight improvement over 1959 for North America, less than 1%. For the rest of the major producing areas the improvement was about 9%. Thus, while North America's exports increased it was not enough to match the other area in production gain. The competition is very severe and always there is on the horizon, in Europe especially, the specter of the synthetic fibers which are gaining in production.

The pulp is shipped, literally, all over the world. Scandinavia shipped to 29 different countries. The United States shipped to 29 nations, also. The big consumers are still the United States, United Kingdom, Italy, West Germany and Japan, but India and Pakistan are becoming major buyers moving up to a total of 45,220 tons between them in 1960.

Aside from North America, the other major producing area for these pulps is Scandinavia. Sweden is the most important of these three countries, producing 479,000 tons in 1960 which is a substantial increase over 397,000 tons produced in 1959. Sweden consumed 40,000 tons domestically, with the United Kingdom being its biggest customer, followed by Italy and France. Finland is becoming a substantial producer of these grades, manufacturing 202,000 tons in 1960 vs. 169,000 tons in 1959. Norway's production remains fairly stable with 145,000 tons in 1959 and 152,000 tons in 1960. The increases of 1960 over those of 1959 are considerably greater than the increases in North America.

The North American production was only just above that of 1959 and the entire gain was in the United States, as Canada lost ground. The United States production was 1,104,000 up from 1,091,000. In Canada the 1960 figure was 323,000 against 363,000 in 1960. Thus, the down-trend in Canada continues. This was forecast last year particularly with respect to the overseas shipments which fell from 95,000 to 74,000 in 1960.

The exports from the United States rose in 1960 to 415,000 tons from 285,000 tons in 1959, but bear in mind the Japanese mill in Sitka, Alaska, which is captive, is reporting shipments as a United States export. The actual gain in non-captive business was about 30,000 tons in 1960 and not the amount indicated in the first figures. The statistics in Table I, taken from sources of the U.S. Pulp Producers Assn., show the trend of these shifts.

One more comment on these figures.

TABLE I

U. S. PURIFIED WOOD CELLULOSE
(In Short Tons)

Year	*Production*	*Imports*	*Exports*	*Net Available*
1938	171,650	65,220	72,800	164,070
1943	369,731	129,380	22,884	476,226
1944	429,545	132,675	10,729	551,491
1945	355,820	146,030	13,030	488,820
1946	295,680	198,540	9,300	484,920
1947	408,460	248,070	14,570	641,960
1948	421,924	239,842	14,665	647,101
1949	371,422	154,348	3,857	521,913
1950	473,210	238,856	27,284	684,781
1951	615,776	230,038	32,944	812,920
1952	705,828	223,340	61,850	867,315
1953	678,180	255,781	66,513	867,448
1954	775,003	230,384	161,916	843,471
1955	980,875	215,100	207,100	988,875
1956	940,660	201,600	212,100	930,160
1957	1,021,000	188,310	258,190	951,120
1958	930,140	183,700	230,260	883,580
1959	1,085,050	204,480	285,700	1,007,330
1960	1,139,940	232,000	415,385	956,555

Source: U.S.P.P.A.

TABLE II

NORTH AMERICAN PURIFIED WOODPULP
(Short tons)

Year	*Production*	*Imports*	*Exports*	*Net Available*
1947	707,000	23,700	56,000	674,700
1948	754,000	14,900	80,400	688,500
1949	620,930	4,550	83,150	542,330
1950	796,312	9,745	83,149	722,908
1951	1,014,240	4,152	151,029	867,363
1952	1,129,400	3,317	181,471	951,245
1953	1,132,338	1,549	214,658	919,229
1954	1,230,588	2,241	307,729	925,100
1955	1,400,950	508	341,080	1,060,378
1956	1,352,410	—	355,100	997,310
1957	1,362,400	—	376,890	985,510
1958	1,236,690	—	295,360	941,330
1959	1,451,620	—	389,500	1,062,120
1960	1,463,100	—	489,385	973,715

Canada export fell from 102,220 in 1957 to 65,100 in 1958.
Source: U.S.P.P.A.

TABLE III

U. S. RAYON-ACETATE PRODUCTION BY TYPES
(Short Tons)

Year	*Viscose & Cupra-ammonium Filament*	*Acetate Filament*	*Viscose Staple & Tow*	*Acetate Staple & Tow*	*Total*
1949	272,150	127,500	64,900	32,350	496,900
1950	313,500	163,500	94,500	58,500	630,000
1951	329,050	150,050	103,650	64,350	647,100
1952	297,250	117,150	105,900	47,600	567,900
1953	328,800	114,650	109,550	45,450	598,450
1954	254,450	98,950	155,750	33,700	542,850
1955	317,500	115,050	168,900	28,900	630,350
1956	278,400	96,400	170,500	28,650	573,950
1957	253,200	103,950	185,600	28,150	570,900
1958	206,550	111,300	162,100	27,200	507,150
1959	254,050	119,800	179,550	35,500	583,900
1960	213,150	114,100	157,000	30,000	514,250

Source: Textile Organon

Remember that the Japanese mill at Sitka is included. The 1960 production for North America is the highest so far but it is only slightly above the figure for 1955 which did not include the Sitka mill. Now take a look at the net available figures which represent the pulp consumed in North America and note that they have been moving on a plateau since 1952.

The world production of rayon-acetate in 1960 managed to creep up over 1959 by just about 2%, rising from 2,780,000 tons to 2,845,000 tons, as estimated by *Textile Organon* in February. These figures could be a

little misleading, because the United States suffered a drop in production of nearly 70,000 tons so that the rest of the world gained about 7% over 1959. In filament yarn the greatest gain was registered in Japan, with European nations and the United Kingdom also showing gains. In acetate and rayon staple Spain, Japan and the United Kingdom showed the greatest gains.

The United States production formed about 18% of the world production against 21% in 1959. It seems clear from these statistics also that rayon acetate in the United States is standing still, or falling behind, when compared with the rest of the world. This appears to be the natural development and is to be expected in the use of man-made fibers throughout the world.

The Tire Cord Battle

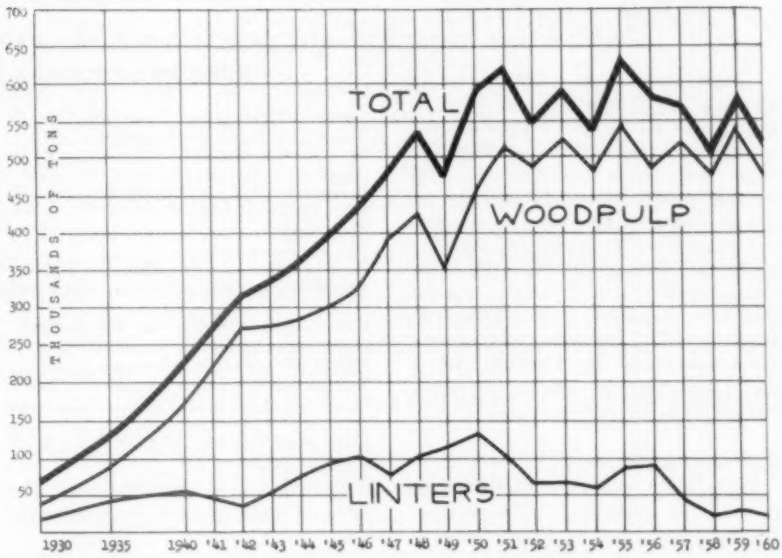
In Table III (U.S. rayon-acetate production by types) the plateau movement is demonstrated once again and, if anything, it is beginning to tip a little downward. This is carried through all categories in the table, no one type is doing much better than the others.

Over the next few years this pattern will probably continue with its future trend dependent on the outcome or the direction of the rayon-nylon tire cord struggle. This end use in 1960 consumed 119,800 tons of rayon, which is 57% of the viscose filament produced and 33% of all viscose produced. The loss of tire cord would be, as things stand now, an irreplaceable loss as there are no new uses in view to absorb anywhere near this tonnage and this, of course, would be reflected immediately in the production of dissolving pulp. In 1960 nylon moved up to 37% of all tire cord production from 29% in 1959 and 28% in 1958.

One symptom of this epic struggle was the price action on viscose cord which jiggled around during the year and which came out into the open in August when a reduction of 2½ cents per pound was announced. Exactly the same reduction was made on nylon shortly afterward. Dissolving pulp prices, which have been stable for years, also reacted with regular grades dropping down to the $165/$175 range and the high tenacity grades dropping down to the $185/$190 range. The acetate pulps were not untouched as they came down to the $200 level.

This tire cord competition is no penny ante affair; the stakes are in the millions and the players are some of the largest corporations in America. There probably has never been another episode similar to it in American business history and it may be symptomatic of our growing scientific-industrial structure where new products and new processes come far more rapidly than the business world expects.

Television fought radio and the movies and the movies finally found a way to coexist by getting most of the programs on film but during the struggle many of the old studios changed hands. The transistor is now engaged in eliminating the vacuum tube from many of its uses and the newer electronic gear is not even designed for tubes. Automation is moving terrifyingly fast in more and more industries and sober scientists seriously discuss the degree to which a computer can think. We have only just begun to see the side effects of our space research program and this effort is so broad and deep in its industrial impact and moving so fast that some day its effects will seem to be tumbling on us, so rapidly will they come. The years of work that go into research are usually only disclosed when the product is announced.



WOODPULP CONTINUES AS DOMINANT RAW MATERIAL used in rayon acetate production in U.S.A. Its consumption, however, declined in 1960 to 481,000 short tons from 550,000 in 1959. Cotton linters pulp consumption also declined to 22,000 short tons, from 29,000 in 1959. Total consumption was 503,000 tons compared with 579,000 in 1959. It dropped back almost to the 1958 level (501,000), lowest in 21 years.

TABLE IV

U. S. RAYON ACETATE CONSUMPTION—Woodpulp vs. Cotton Linters (Short Tons)

Year	*Total Pulp*	*Woodpulp Consumed*	*%*	*Linters Pulp Consumed*	*%*
1930	63,850	45,000	62	27,000	38
1935	131,077	86,000	63	51,000	37
1940	235,585	178,000	75	60,000	25
1942	316,308	280,500	88	39,500	12
1944	361,977	285,000	78	82,000	22
1946	427,000	323,000	75	105,000	25
1947	478,000	397,000	83	81,000	17
1948	539,500	435,000	81	104,500	19
1949	476,600	348,700	73	127,900	27
1950	590,600	456,200	77	134,400	23
1951	616,300	515,500	84	100,800	16
1952	549,500	484,700	88	64,800	12
1953	589,100	522,000	89	67,100	11
1954	537,800	477,300	89	60,500	11
1955	634,500	546,900	86	87,600	14
1956	577,400	487,000	84	90,400	16
1957	566,000	517,000	91	49,000	9
1958	501,000	479,000	96	22,000	4
1959	579,000	550,000	95	29,000	5
1960	503,000	481,000	96	22,000	4

Source: Textile Organon

. . . PULP TRENDS

Which way will it go—the tire cord struggle? Wall Street has already decided that it is only a matter of time until nylon takes over and then the Street goes on to speculate what will replace nylon. There is enough capacity now to take over and one tire manufacturer, Firestone, is entering into nylon production. Plans made, or being made, by such viscose producers as American Enka, Industrial Rayon and Beaunit, along with expansions announced by DuPont, Allied and Dow will add 50% to the nylon capacity by the end of this year.

TABLE V

PURIFIED WOODPULP END-USE PATTERN—1960

	Short Tons
Net Available for North America	973,710
Consumed in Canada	50,340
In-transit shipments	25,000
Balance available for United States	898,370
Rayon acetate textiles	481,000
Cellophane	216,000
Balance for other uses	201,370
Plastics including nitrocellulose & film	49,000
Miscellaneous viscose (sponge, caps, bands, sausage casings, seals)	9,000
CMC	10,000
Filters (industrial, cigarette, automotive)	48,000
Other derivatives	4,000
Plastic fillers and miscellaneous	6,000
Vulcanized fiber and all grades of paper	75,370

Comment on Table V

Cellophane continues to be a bright spot in the dissolving pulp picture. During 1960, a recession year, its production held up to 216,000 tons, only a little below that for 1959 which was 218,000 tons. Statistics on this product being what they are, it can be said with some honesty that the two years are the same.

As a usable film for packaging this material is not anymore, just converted cellulose. It is coated with many different materials such as nitrocellulose and saran. If you wish to admire ingenuity in industry look at a piece of it and imagine the problems involved in putting a micro-thin coating on it. This year should see a substantial increase in the use of cellophane as the general business condition improves and as more and more products are pre-wrapped.

In the table, an attempt has been made to allocate the quantity of these pulps going into various end-uses.

Pulping Around the World— All Nations Will Find a Way

U.S.A. and Scandinavia each ship dissolving pulps to 29 countries

By FRANK T. PETERSON
President, The Black-Clawson Co.

METAPHORICALLY SPEAKING, we live today in a cellulose world.

First, today's economic renaissance throughout the world demonstrates more and more that nations must rely on indigenous raw materials for the production of finished goods in order to achieve and maintain economic self-sufficiency.

Second, the phenomenon we label with the over-worked phrase "population explosion," coupled with the profound need in many countries for better living standards, provides irresistible impetus for the development of the pulp and paper industry throughout the world.

Today, world population is 2,950,000,000. In 15 years it will reach 3,800,000,000. World per capita paper consumption averages about 50 pounds per year. Since 1954 the growth has been at the rate of one pound per year and this is expected to accelerate with the spread of culture and industrialization to the many under-developed areas. When we multiply the increasing rate of per capita consumption by the predicted growth in population, we reach a demand figure for pulp and paper production which staggers the imagination.

Pulp and papermaking is as fundamental to civilization as agriculture. It is the basic medium for the dissemination of knowledge and the recording of literature. It serves the cause of better teaching in the all important efforts to eliminate illiteracy and raise standards of living. It provides the instrument for recording history, for economic and political communication, and for packaging most of our food products and manufactured goods. The uses and contributions of paper are interminable.

The pendulum of history swings from the production of the first papers from mulberry and papyrus to the use, in more recent decades, of wood fiber as the predominant raw material, and now, on the back-swing, to the resurgence of the use of agricultural fibers. One of the earliest sources of paper fiber was bamboo. Today, bamboo is once again a leading raw material for paper in India and other east Asian countries. Several varieties of

MR. PETERSON: ". . . competing systems for continuous pulping adds impetus to growth. . . ."

bamboo are also being employed in Latin America. Although approximately 85% of all papers are still made from wood fibers, the advance of agricultural fibers toward a rank of increasing importance is a significant and undeniable global trend.

The swing of the pendulum is also evident in the history of hardwood pulping. The earliest chemical pulping by the original soda process was conducted on willow and poplar hardwoods. However, as chemical pulping continued to develop, it was directed mainly toward softwood utilization. So the trend continued for many years until the fairly recent revival of hardwood chemical pulping.

North America

In a brief round-the-world survey of raw materials for the industry, let us first take North America, or more accurately, Canada and the United States. We have three prime raw materials which will be the mainstay of our pulping in the foreseeable future. These are softwoods, hardwoods and waste paper.

With the fast maturity of pine in Southern United States and steady progress in intelligent farming and harvesting of these woods, we should have little cause for immediate concern in this area. In Canada and the Pacific Northwest, abundant softwood timber supplies are expected to prevail in moderately stable productivity. Inasmuch as wood will remain our prime and predominate source of raw material, we can predict the U.S. and Canadian research in pulping processes will be mainly directed to improved methods of utilizing this traditional source of supply.

In New England and the Lakes States of U.S.A., we can point to a relatively small but continuing revival in wood pulping since the low period of the '30's when the general recession and depletion of available softwoods combined to shut down many mills. In large part, the revival has come through increased utilization of the hardwoods native to the regions.

Pulpwood consumption statistics as compiled by the U.S. Bureau of Census emphasize the growing importance of hardwoods. In the period 1952-59, while annual softwood consumption in the North Central region of U.S.A. dropped from 2.0 million cords to 1.8 million, hardwood consumption rose from 0.9 million to 2.0 million, overcoming the softwood loss and adding a million cords to the total consumption. Although not as pronounced, the trend is the same in the Northeastern states.

Hardwoods have played an equally important role in the rapid growth of pulping in general in the Southern states. The South now produces more than half of all the hardwood pulp in the U.S. industry.

Hardwoods are now chemically pulped by the kraft, neutral sulfite semi-chemical, cold soda, and modified sulfite processes. Contributing to the commercial success of these systems are the modern developments in continuous processing, which are also attaining increasing acceptance for softwood pulping.

There are still other areas of research contributing to an optimistic outlook for the North American wood supply for the next 25 years and beyond. These are the advancing sciences of forest management and wood genetics.

Five Major Pulping Trends Forecast

Mr. Peterson cites these five ways world pulp needs will be met:

1. There will be greater emphasis on the utilization of indigenous raw materials for pulp making, especially agricultural fibers and other grasses.
2. In the basic wood-growing countries of the world—primarily the United States, Canada, Scandinavia, Russia, New Zealand, etc., the stress for a long time to come will be on technological advances in wood fiber pulping.
3. Studies in wood genetics will increase, culminating in the development of improved tree varieties to meet the ultimate pulp requirements.
4. The industry will trend more and more to continuous digestion and processing.
5. The need for greater utilization of waste paper as a raw material will produce notable advancements in its collection and processing.

Waste Paper

In periods of virgin fiber shortages, the North American industry, especially in the United States, makes strong demands on its waste paper supplies. It is a rule of thumb that for every 4 lbs. of virgin fiber produced, there will be an increase of 1 lb. in the supply of available waste paper. This barometer indicates that in the next 15 years the repulping and reuse of waste paper in the United States will increase another 10,000,000 tons annually. The present 9,000,000 tons annual consumption is not a figure to treat lightly. I believe that it is not erroneous to prognosticate that the consumption by 1975 will be at least 15,000,000 tons, and probably closer to 20,000,000 tons annually.

Pulping Developments

We must recognize that for many years to come the North American industry will be basically oriented on virgin woodpulp and will direct its major energies toward improvements in mechanical and chemical pulping of wood. With the industry's increasing emphasis on research and development, the basic processes have come under critical study, and numerous improvements have been made.

The traditional calcium base acid sulfite process has undergone important modifications through the application of magnesium, or ammonium, or sodium base recovery to the standard system. The cooking liquid differs from conventional sulfite in its freedom from excess sulfurous acid and thus from excess sulfur dioxide vapor pressure. With the elimination of SO_2 many advantages occur: During operation, pulp can be cooked faster at higher temperatures with greater control of yield and strength at lower operational costs. The system also eliminates problems of stream and air pollution through chemical recovery, is adaptable to a variety of species, either single or mixed, permits semi-chemical or full chemical operation with a single recovery system, gives higher yield and greater fiber strength and allows production of high brightness, unbleached and easily bleached pulps.

Several mills have worked out a high yield type cooking based on the traditional acid sulfite process. This is accomplished through shorter cooking times with resulting higher hemicellulose and lignin in the cooked pulp.

The same type of accelerated cooking has been applied to the standard kraft process with even greater success than with high yield sulfite. Considerable tonnages of high yield kraft are

being produced in the linerboard mills of Southern United States with yields up to 65%.

Although the neutral sulfite process is not new, it is the youngest of our general group and has shown spectacular growth in the last 20 years. Much of the research in this field has been directed to continuous rather than batch processing with the result of a highly dependable low cost system which is extremely well adapted to and has been pointed mainly towards use of hardwood species.

Since the introduction of modern cold caustic pulping by the U.S. Forests Products Laboratory only a little more than ten years ago, it has come forward as an extremely versatile, high yield system which promises a rapid growth—equal perhaps to that of semi-chemical. It has recently gained impetus with the introduction of several systems for continuous operation.

The chemigroundwood process, permitting the grinding of Northeastern, dense hardwoods, utilizes 4 foot logs which are dropped into a large pressure vessel where a mild sodium sulfite solution is forced into the wood at 150 lbs. hydrostatic pressure.

The logs are softened so that they do not create the usual high frictional resistance in the grinding process. Grinding horsepower is reduced, the yield and strength of the fiber are increased, and a pulp with a high drainage rate results.

Pulping Outside of North America

In Scandinavia—Norway, Sweden, Finland—and in the Soviet Union, the preponderance of northern wood species makes it inevitable that progress in pulping follow much the same line as in North America. This is also true of Australia, New Zealand, and many other countries where wood is the major source of fiber. Much of the growing Latin American industry is already wood-based and can also be expected to develop after the pattern of North America and northern Europe. It will be some years, however, before the many technological and economic problems of utilizing tropical and semi-tropical species are overcome. Nevertheless, we can look on Latin America as an awakening giant in the world fiber economy.

In round figures, let me present for a sampling of these woodpulp producing nations, their existing capacities, percent of increase through currently planned expansion, and estimated productivity by 1965 or earlier:

PRINCIPAL WOODPULP PRODUCING NATIONS
Existing Capacities—Planned Expansion—Estimated 1965 Productivity

	Current Pulping Capacity (short tons)	*Planned % Increase*	*Estimated Production by 1965 (short tons)*
Sweden	4,800,000	48%	7,100,000
Finland	3,500,000	49%	5,300,000
USSR	3,300,000	118%	7,200,000
Brazil	400,000	115%	860,000
Mexico	170,000	124%	380,000
Japan	2,700,000	74%	4,700,000
Australia/New Zealand	520,000	73%	900,000
	15,390,000	72%	26,440,000

Other Primary Fibers

Although 85% of the present world tonnage of paper is produced from wood fibers, other fiber sources have long since proved themselves acceptable as raw materials. There is every indication that the use of agricultural fibers and other fast growing plants will increase in importance, especially in wood-poor countries which are nevertheless determined to establish and maintain a native, self-sufficient paper industry.

Straw

In Europe, for instance, let us take the example of Holland. Practically devoid of timber resources, Holland has held a ranking position as a paper producer through intelligent utilization of straw as basic raw material to supplement its imported woodpulp. Since the end of World War II great credit in this accomplishment must be given to N.V. Research-en Adviesbureau Voor Stroverwerking, which has greatly advanced the technology of straw pulping in Holland.

Around the world, straw pulping—wheat, rice or rye—promises to grow in importance even though the unfavorable economics of its procurement and storage has diminished its importance in North America. It is an established raw material in Denmark, East Germany, Hungary, Rumania, USSR, England, Argentina, Mexico, Japan, and Korea, and forms one basis of planning for the nascent industries of Egypt, Indonesia, South Africa.

Bagasse

Even though cereal straws have a long history as raw materials for papermaking, the world prospects now favor even greater utilization of other annual and fast-growing fibers, particularly sugar cane bagasse. A modern problem in straw utilization is the high cost of collecting and storing the raw material, particularly since the advent in some countries of combine threshing, which leaves the straw stalks scattered over the growing fields. Bagasse, on the other hand, accumulates in quantity outside of a sugar mill during the grinding seasons and can be used directly in the pulp mill or can be readily baled and stored for off-season use.

The world potential for bagasse pulp is large because of its availability in suitable quantities in so many different geographic areas. The West Indies, Mexico, Central America, and most countries of South America grow sugar cane in abundance. It is a common commodity in Egypt and South Africa, in most of the countries of Southeast Asia, in the Philippines and Hawaii, and even in the Southern United States where two mills now utilize bagasse for bleached fine paper and building board production. A third mill for molded pulp products is now projected.

The world count of bagasse-based mills in operation or in advanced stages of construction is high:

1. Cuba—Three mills, making newsprint, unbleached papers and bleached papers; total rated capacity 240 tons per day.
2. Peru – Two mills, making bleached and unbleached papers and cement bag paper; total capacity, 200 tons.
3. Puerto Rico—One mill, producing 120 tons per day of paperboard and bag and wrapping papers.
4. Brazil—Three mills, making writing and printing grades, corrugating medium and market pulp; total capacity, 135 tons per day.
5. Colombia – Two mills for bleached papers and corrugating medium; total capacity, 105 tons per day.
6. India—Five mills, making newsprint and wide range of papers in which the bagasse pulp is frequently blended with bamboo pulp; total capacity, 350 tons per day.
7. Philippines – Two mills for bleached papers; total of 85 tons per day.
8. Argentina—Two mills for coarse papers and bleached fine papers; total capacity, 120 tons.
9. Mexico—Three mills for tissue grades and bleached market pulp; total capacity, 140 tons.
10. South Africa—One 40-ton mill producing corrugating medium.
11. Taiwan—One 80-ton market pulp mill furnishing 45% of the total

pulp consumed in Taiwan in a wide variety of papers.

12. Egypt—One 60-ton mill now under construction to supply unbleached pulp.

13. Venezuela—One 60-ton mill under construction to integrate with paper mill producing wrapping, bag, linerboard, and corrugating medium.

Bagasse pulp is also in use in building board mills in Hawaii, Australia, and England and in hardboard mills in Cuba, Taiwan and Egypt.

Even in total, these operations represent a relatively small tonnage contribution to the world fiber supply. They add up to slightly more than 2000 tons per day—about equal to the output of one of the largest Southern United States kraft mills. Nevertheless, they demonstrate the undeniable trend which pulping development will follow at an accelerating rate in the newly developing economies of many countries.

Bamboo

Botanically a perennial grass, bamboo has become a major source of fiber in India, China, Japan, the Philippines and other southeast Asia areas. Although dry bamboo chips are extremely dense and difficult to penetrate, they respond successfully to modern pulping methods, including the continuous processes, and yield a fiber with high tear resistance and moderate bursting strength.

Especially in India, bamboo pulps are frequently blended with bagasse pulps to give a well-balanced pulp suitable for use in a wide range of furnishes.

Some pulping experts have suggested that bamboo may some day be widely cultivated as a fiber crop, perhaps even in Southern United States.

Esparto

This North African grass (*Lygeum spartum*) has been pulped, especially by British fine paper mills, since 1861. Until now, however, the raw material was bulk shipped at high cost from North African ports to the consuming mills. Pulping was accomplished in most instances by the soda process in small batch operations in integrated mills, except for two or three small European market pulp mills. Over the years, the economics of this procedure have grown less and less favorable. Extensive investigations of rapid continuous pulping of esparto have recently changed this picture, however. A 90 ton per day pulp mill is now under construction in Tunisia to produce bleached esparto pulp for world markets. Other esparto growing countries are expressing interest in following this example.

Reeds

The delta regions of the Danube and Volga Rivers in southeastern Europe produce reeds (*Phragmites communis*) that are being pulped successfully after much research, especially in finding efficient mechanical means for harvesting them. It is estimated that in the Soviet Union alone, 25 million tons of reeds are available annually. Four mills with a total output of over 800 tons per day are under construction to produce reed pulp in these regions.

As yet, other papermaking fibers are reaching commercial production only in small quantities. Among these are corn stalks, hemp, abaca, sisal, elephant grass, flax, ramie, and kenaf. Continuous pulping investigation of all these materials have produced favorable results leading to the conclusion that almost every country has some fibrous raw material which can be converted into high quality pulp and paper—usually economically.

Continuous Processing

In making this survey, we have made frequent reference to continuous methods of pulping. The technological advance which continuous processing has made over traditional batch digesting is evident in the wood pulping field as well as the pulping of other fibers. No survey of world pulping developments would be complete without recognition of this development. At this moment, probably not much more than 10% of the world's pulp from all raw materials is produced continuously, but the development is still in its infancy. We must all realize that continuous processing is an extremely healthy child which will gain strength and even dominance as the years go by.

There are a number of competing systems for continuous pulping—a situation which adds greater impetus to the growth of the concept as a whole. In the area of neutral sulfite semichemical pulping, continuous processing is already dominant. Cold soda pulping is inextricably tied to continuous processing, and each year an increasing number of full chemical pulp mills are discarding batch digestion in favor of continuous systems. In the broad economic picture this development contributes to world fiber economy in lower costs of pulp production, more efficient use of raw materials.

Waste Paper Outside U.S.A.

As the rest of the world approaches the level of paper consumption in the U.S.A., waste paper becomes an increasingly important supplement to virgin fiber as a raw material.

In 1959 Great Britain formed a Waste Paper Utilization Council to stimulate progress in the same way the U.S. council functions. The 26.5% contribution of waste paper fiber to the total board and paper production of the U.K. in 1959 equals the U.S. percentage for that year. In general, the same situation prevails in all of the large paper consuming countries of Europe.

Reports delivered last fall at the Tokyo Conference on Pulp & Paper Development in Asia and the Far East stressed the high rate of waste paper recovery within the Asian countries and the extensive importance of secondary fibers by paper producing countries where virgin fiber production is still negligible.

One Billion Dollars Per Year

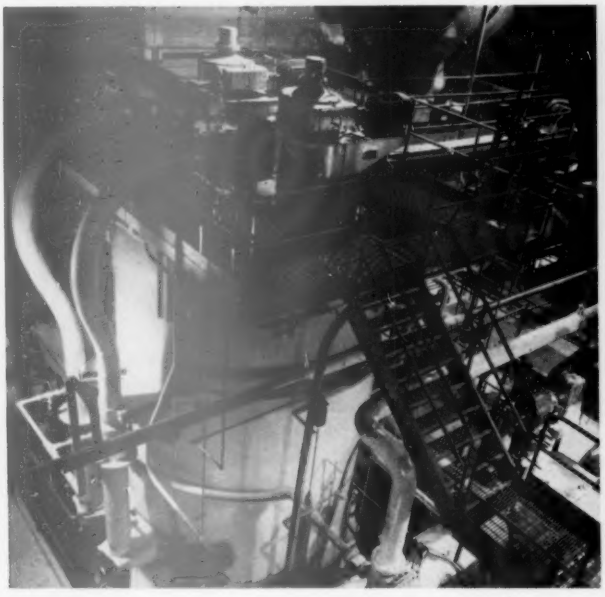
Even though fiber-rich, well-established, pulp producing countries cannot possibly satisfy all of the eventual world demand, they nevertheless, can be expected to expand their industries more rapidly than newly developing countries. The reason for this is financial. The FAO survey of world demand issued in 1960 points out that for production to keep pace with demand in the period from now until 1965 an annual investment of $1,000,000,000 will be necessary. In the following ten years to 1975, when demand will be nearly 150,000,000 tons of paper and paperboard, the cost of building new capacity may very well reach $1,500,000,000 per year. Perhaps half of the needed capital will be obtained and spent in North American and Western Europe. In the deficit regions of the world, the money promises to be harder to come by, and in the final analysis must come as venture capital from established governmental and private sources.

It seems safe to predict that such a vigorous and necessary industry as ours will find ways to meet the demands upon it. This means that to progress from the present world pulp production of something over 60,000,000 tons, we must add new capacity at the rate of over 4,000,000 tons per year to reach the 1975 goal of nearly 150,000,000 tons set by FAO predictions.

The entire world pulping industry has an insatiable appetite for technological advancement. I believe the ancient theory that the paper produced on the paper machines is only as good as the pulp supplied, will be more pronounced in the next decade. Let us not for a moment restrain our energies from pulping developments.

(The above article constitutes major portions of an address made by Mr. Peterson at the 50th anniversary of New York State College of Forestry.)

From mile-upon-mile of forests, come slow-growing northern softwoods that . . .



. . . in North America's largest fully proven Kamyr continuous digesters, then . . .

. . . the fibers are "cold-blown" to retain their maximum strength and . . .

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Now proved in over one hundred paper mills throughout North America, Alberta Hi-Brite Bleached Sulphate Pulp owes its success and versatility to many factors, including:

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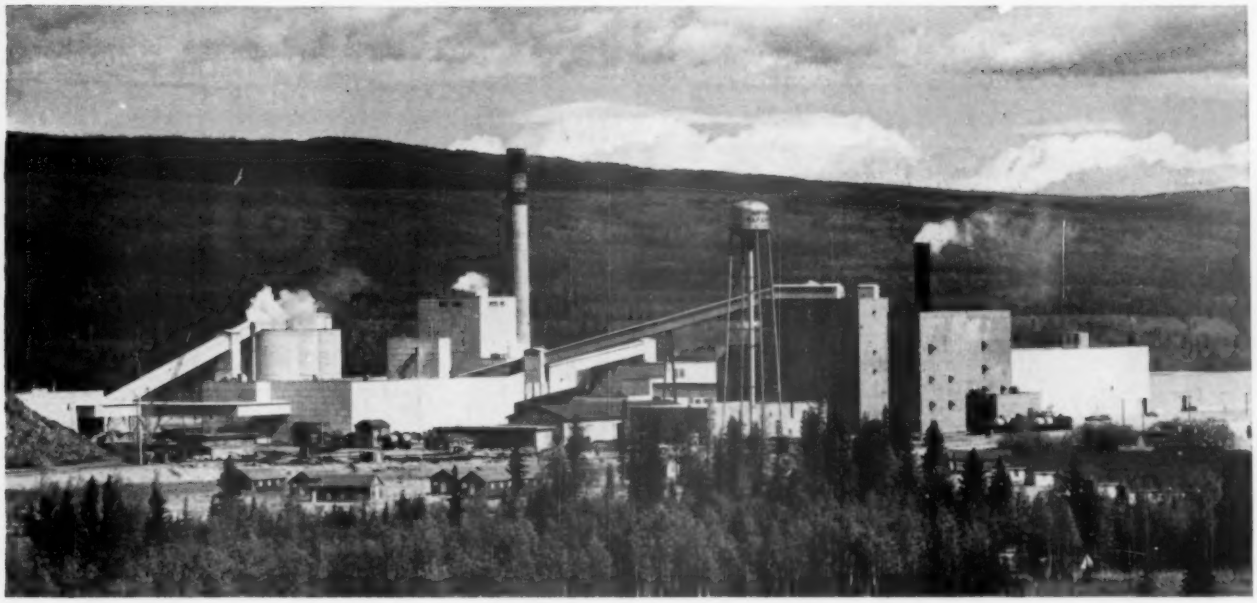
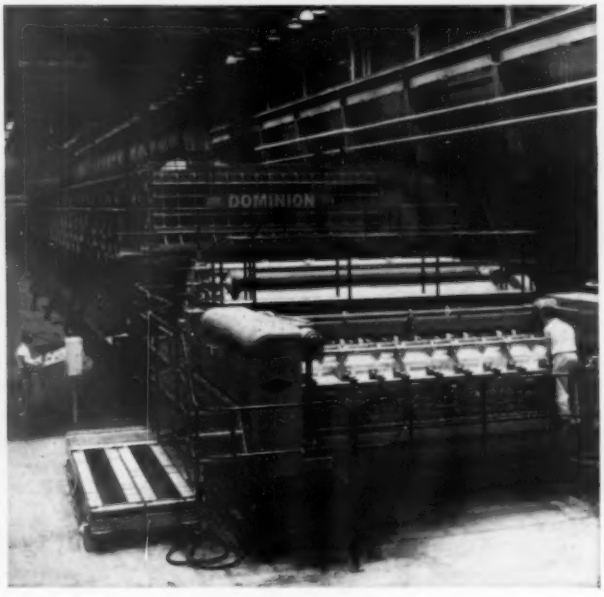
- Huge Kamyr continuous digesters that closely control all the variables in pulp cooking and thereby assure a more uniform pulp.
- "Cold-blowing" of fibers as they leave the digester to safeguard their strength.
- Bleaching with the multistage Hinton sequence developed by St. Regis®, thus assuring pulp of maximum strength, brightness and cleanliness.



. . . go into one of the most up-to-date market pulp mills anywhere. Here chips are processed . . .

. . . bleached in six stages for gleaming whiteness. The final result . . .



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nearly any paper better!

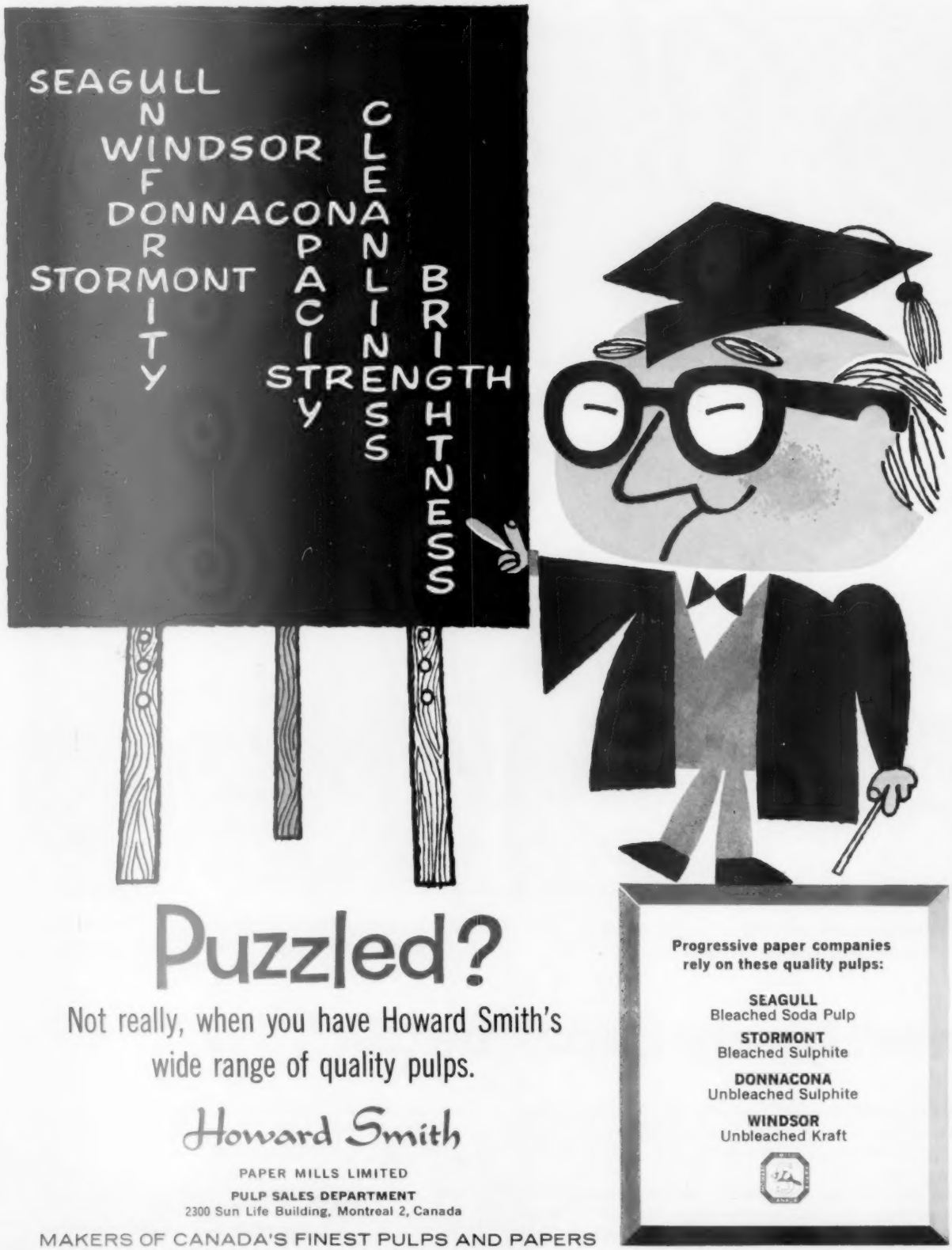
• Dependable year-in, year-out pulp delivery because Alberta Hi-Brite is made by the largest producer of northern bleached kraft market pulp in the western hemisphere.

Get the full story on Alberta Hi-Brite Bleached Sulphate Pulp . . . and the advantages it offers. St. Regis Paper Company, 150 East 42nd St., New York 17, N. Y.

KRAFT DIVISION

St.Regis PAPER COMPANY

Professor Pulp takes time out...



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2300 Sun Life Building, Montreal 2, Canada

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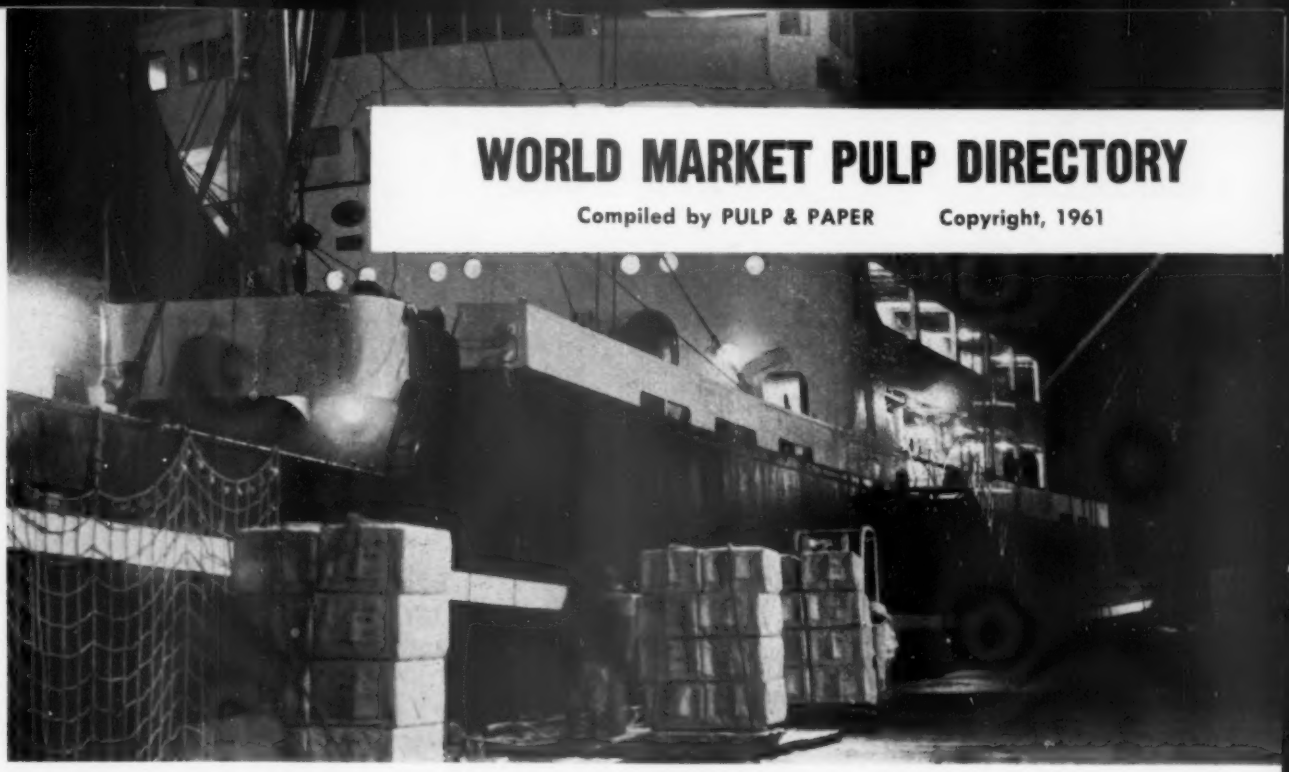
STORMONT
Bleached Sulphite

DONNACONA
Unbleached Sulphite

WINDSOR
Unbleached Kraft



WORLD MARKET PULP DIRECTORY

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Worldwide Directory by Grades

Information on addresses, trade names, etc., may be found in the listing by companies which immediately follows this section.

Dissolving and Special
Alpha

Austria
Kellner-Partington Paper Pulp Co., Ltd.
Lenzinger Zellulose- und Papierfabrik

Canada
Alliance Paper Mills, Ltd.
Canadian International Paper Co.
Columbia Cellulose Co., Ltd.
Rayonier Canada Ltd.
St. Raymond Paper, Ltd.

Finland
Enquist, J. W., Oy
Oy Kaukas Ab
Rauma Repola Oy

France
Sica S.A.

West Germany
Zellstofffabrik Waldhof

Japan
Kokoku Rayon and Pulp Co., Ltd.
Kokusaku Pulp Industry Co., Ltd.
Nippon Pulp Industry Co., Ltd.
Sanyo Pulp Co., Ltd.

Norway
Borregaard, A/S
Mathiesen-Eidsvold Vaerk
Saugbrugsforeningen

Sweden
Bengtsfors Sulfitaktiebolag
Billerud A/B
Edsvalla Bruk, A/B
Forss A/B
Korsnäs A/B
Mo & Domsjö A/B
Molnback-Trysil, A/B
Ströms Bruks A/B
Svenska Cellulosa A/B
Uddeholms A/B
Utansjö Cellulosa A/B
Wifstavarfs A/B
Wikmanshytte Bruks A/B

United States
Alaska Lumber & Pulp Co.
Brown Company
Buckeye Cellulose Corp.
International Paper Co.
Ketchikan Pulp Co.
Rayonier Inc.
Scott Paper Co., West Coast Division
Weyerhaeuser Co., Pulp and Paperboard Div.

Paper Grades
SULFITE, BLEACHED

Austria
Arland Papier- und Zellstoff-Fabriken AG
Brigl & Bergmeister AG
Hamburger, W.
Kellner-Partington Paper Pulp Co. Ltd.
Leykam-Josefsthal AG
Neusiedler AG
Pölser Zellulose- und Papierfabrik AG
Steyrermühl AG
St. Michael AG

Canada
Abitibi Power & Paper Co., Ltd.
Alliance Paper Mills, Ltd.
Canadian International Paper Co
Columbia Cellulose Co. Ltd.
Fraser Companies, Ltd.
Gaspesia Sulphite Co., Ltd.
Howard Smith Paper Mills Ltd.
Irving Pulp & Paper Ltd.
North Western Pulp & Power, Ltd.
Rayonier Canada Ltd.
Spruce Falls Power and Paper Co., Ltd.

Finland
Enquist, J. W., Oy
Haarlan Selluloosayhtio
Kajaani Oy
Oy Kaukas Ab
Kymmene, Ab
Metsaliiton Selluloosa Oy
Rosenlew, W. and Co., Ab
Serlachius, G. A., Oy
Veitsiluoto Oy (V.L.)
Yhtyneet Paperitehtaat Oy

West Germany
Aschaffenburger Zellstoffwerke AG
Zellstofffabrik Waldhof

Japan
Kokoku Rayon and Pulp Co., Ltd
Kokusaku Pulp Industry Co., Ltd
Nippon Pulp Industry Co., Ltd.
Sanyo Pulp Co., Ltd.
Tohoku Pulp Co., Ltd

Norway
Borregaard, A/S
Greaker Cellulosefabrik A/S
Krogstad Cellulosefabrik A/S
Mathiesen-Eidsvold Vaerk
Mjöndalen Cellulosefabrik A/S
Tofte Cellulosefabrik A/S
Toten Cellulosefabrik A/S
Vestfos Cellulosefabrik A/S

Portugal
Caima Pulp Co., Ltda

Sweden
Bengtsfors Sulfitakiebolag
Bergvik och Ala A/B
Billerud A/B
Edsvalla Bruk A/B

Forss A/B
Hissmofors A/B
Hylte Bruks A/B
Iggesunds Bruk A/B
Klippans Finpappersbruk A/B
Korsnäs A/B
Marma-Långrörs A/B
Mo & Domsjö A/B
Molnbacka-Trysil, A/B
Munkedals A/B
Stora Kopparbergs Bergslags A/B
Ströms Bruks A/B
Svenska Cellulosa, A/B
Uddeholms A/B
Wifstavarfs A/B

Switzerland
Cellulosefabrik Attisholz AG
Papierfabrik Perlen

United States
Alaska Lumber & Pulp Co.
Crown Zellerbach Corp.
Eastern Fine Paper and Pulp Division, Standard Packaging Corp.
International Paper Corp.
Ketchikan Pulp Co.
Penobscot Chemical Fibre Co.
Puget Sound Pulp & Timber Co.
Rayonier Inc.
St. Regis Paper Co.
Scott Paper Co., West Coast Division
Weyerhaeuser Co., Pulp and Paperboard Div.

Yugoslavia
Fabrika Celuloze (Prijedor)
Fabrika Celuloze I Papira "Duro Salaj"
Fabrika, Sulfitne Celuloze Medvode
Zagrelbačka Tvornica Papira

SULFITE, UNBLEACHED

Austria
Ahlström, A., Oy
Arland Papier- und Zellstoff-Fabriken AG
Brigl & Bergmeister AG
Hamburger, W.
Leykam-Josefsthal AG
Neusiedler AG
Pölser Zellulose-und Papierfabrik AG
Steyrermühl AG
St. Michael AG

Canada
Abitibi Power & Paper Co., Ltd.
Anglo-Canadian Pulp and Paper Mills, Ltd.
Anglo-Newfoundland Development Co., Ltd.
Bowaters Mersey Paper Co., Ltd
Bowater's Newfoundland Pulp & Paper Mills, Ltd.
Canadian International Paper Co.
Donnacona Paper Co., Ltd.
Fraser Companies, Ltd.
Gaspesia Sulphite Co., Ltd.
Great Lakes Paper Co., Ltd.
James Maclaren Co., Ltd.
MacMillan, Bloedel & Powell River Ltd.
Ontario Paper Co., Ltd.
Quebec North Shore Paper Co.
St. Lawrence Corp., Ltd.
St. Raymond Paper, Ltd.
Spruce Falls Power and Paper Co., Ltd.

Finland
A. Ahlström Oy
Eklöf, Aug., Ab
Enso-Gutzeit Oy
Kemi, Oy
Kymmene, Ab
Nokia Oy
Oy Wilh. Schauman Ab
Serlachius, G. A., Oy
Toppila, Oy
Veitsiluoto Oy (V. L.)
Yhtyneet Paperitehtaat Oy

West Germany
Aschaffenburger Zellstoffwerke AG
Zellstofffabrik Waldhof

Japan
Hokuetsu Paper Mills, Ltd.
Kokusaku Pulp Co. Ltd.
Sanyo Pulp Co., Ltd.
Taio Paper Mfg. Co., Ltd.
Tohoku Pulp Co., Ltd.

Norway
Gulskogen Cellulosefabrik A/S
Katfos Fabriker, A/S

Sweden
Bergvik och Ala A/B
Billerud A/B
Fiskeby Fabriks A/B
Hellefors Bruks A/B
Katrinefors A/B
Mackmyra Sulfit A/B
Marma-Långrörs A/B
Oskarström Sulphite Mills A/B
Stjernfors-Ställdalen A/B
Storviks Sulfiit A/B
Svano A/B
Svenska Cellulosa, A/B
Utansjö Cellulosa A/B
Wifstavarfs A/B

Switzerland
Cellulosefabrik Attisholz AG
Papierfabrik Perlen

United States
Crown Zellerbach Corp.
Spaulding Pulp and Paper Co.

Yugoslavia
Fabrika Celluloze (Prijedor)
Fabrika Celluloze I Papira "Duro Salaj"
Fabrika, Sulfitne Celuloze Medvode
Zagrebačka Tvornica Papira

SULFATE, BLEACHED

Canada
British Columbia Forest Products Ltd.
Canadian International Paper Co.
Celgar Ltd.—early 1961
Dryden Paper Co., Ltd.
The KVP Co., Ltd.
MacMillan, Bloedel & Powell River Ltd.
Marathon of Canada, Ltd., Div of American Can Co.
North Western Pulp & Power, Ltd.
Rayonier Canada Ltd.
Thurso Pulp & Paper Co.

Finland
Enso-Gutzeit Oy
Oulu Oy

France
Cellulose d'Aquitaine
La Cellulose du Rhône

Japan
Hokuetsu Paper Mills, Ltd.
Hyogo Pulp Industry Co., Ltd.
Kokusaku Pulp Industry Co., Ltd.
Nagoya Pulp Co., Ltd.
Nippon Pulp Industry Co., Ltd.
Taio Paper Mfg. Co., Ltd.
Takahagi Pulp Co., Ltd.
Tohoku Pulp Co., Ltd.
Tsurusaki Pulp Co., Ltd.

Norway
Lovenskiold-Vaekero

Portugal
Companhia Portuguesa de Celulose

Sweden
Forss A/B
Iggesunds Bruk, A/B
Kopparfors A/B
Korsnäs A/B
Mo & Domsjö A/B
Munksjö A/B
Statens Skogsindustrier A/B
Stora Kopparbergs Bergslags A/B
Svenska Cellulosa A/B
Uddeholms A/B

United States
Bowaters Carolina Corp.
Brunswick Pulp & Paper Co.
Buckeye Cellulose Corp.
Champion Paper & Fibre Co.
Container Corp. of America
Coosa River Newsprint Co.
Crown Zellerbach Corp.
East Texas Pulp and Paper Co.
Eastern Fine Paper and Pulp Division, Standard Packaging Corp.
Gulf States Paper Corp.
International Paper Co.
Marathon Southern Corp.
Oxford Paper Co.
Penobscot Chemical Fibre Co.
Potlatch Forests, Inc.
Rayonier Inc.
Riegel Paper Corp., Carolina Div.
St. Regis Paper Co.
Scott Paper Co., Hollingsworth & Whitney Div.
Weyerhaeuser Co., Pulp and Paperboard Div.

Yugoslavia
Tvornica Sulfatne Celuloze I Natron Papira

SULFATE, SEMI-BLEACHED

Canada
British Columbia Forest Products Ltd.
Canadian Forest Products Ltd.
MacMillan, Bloedel & Powell River Ltd.

Finland
Oulu Oy
Sunila Oy

Portugal
Companhia Portuguesa de Celulose

Sweden
Korsnäs A/B
Marma-Långrörs A/B
Skogsagarnas Cellulosa A/B

United States
Bowaters Carolina Corp.

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Austria
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Nettingsdorfer Papier-und Sulfatzellulose-Fabrik AG

Canada
Canada Paper Co.
Canadian Forest Products Ltd.
Canadian International Paper Co.
Consolidated Paper Corp., Ltd.
Dryden Paper Co., Ltd.
Fraser Companies, Ltd.
The KVP Co., Ltd.
MacMillan, Bloedel & Powell River Ltd.
St. Lawrence Corp., Ltd.

Finland
Enso-Gutzeit Oy
Joutseno-Pulp Oy
Kemi, Oy
Lohja-Kotka, Oy
Oulu Oy
Sunila Oy

Japan
Kokusaku Pulp Industry Co., Ltd.
Nagoya Pulp Co., Ltd.
Taiko Paper Mfg. Co., Ltd.
Taio Paper Mfg. Co., Ltd.
Toyo Pulp Co., Ltd.
Tsurusaki Pulp Co., Ltd.

Norway
A/S And. H. Kiaer & Co., Ltd.
Lovenskiold-Vaekero

Portugal
Companhia Portuguesa de Celulose

Sweden
Bäckhammars Bruk A/B
Bergvik och Ala A/B
Dynäs A/B
Eds Cellulosafabriks A/B
Fiskeby Fabriks A/B
Forss A/B
Korsnäs A/B
Marma-Långrörs A/B
Sandvikens Cellulose A/B
Skogsagarnas Cellulosa A/B
Statens Skogindustrier, A/B
Svenska Cellulosa A/B
Wifstavarfs A/B

United States
Bowaters Carolina Corp.
Chesapeake Corp. of Virginia
Crown Zellerbach Corp.
Georgia-Pacific Paper Co.
Halifax Paper Co., Inc.
International Paper Co.
Owens-Illinois Mill Div.
Oxford Paper Co.
St. Mary's Kraft Corp.
St. Regis Paper Co.
West Virginia Pulp and Paper Co.

Yugoslavia
Tvornica Sulfatne Celuloze I Natron Papira

SODA, BLEACHED

Canada
Howard Smith Paper Mills Ltd.

Finland
Rauma Repola Oy

United States
The Mead Corp.
New York and Pennsylvania Co.
Penobscot Chemical Fibre Co

SEMI-CHEMICAL

Austria
Hamburger, W.

Canada
Richmond Pulp & Paper Co. of Canada Ltd.

Japan
Sanyo Pulp Co., Ltd.
Taio Paper Mfg. Co., Ltd.

Norway
A/S Vestlandske Treforedling

Sweden
Katrinefors A/B

Switzerland
Dozière S. A., Fabrique de cellulose

GROUNDWOOD

Austria
Holzstoff-Verkaufsstelle GmbH

Canada
Bathurst Power & Paper Co., Ltd.
John Breakey, Ltd.
Canada Paper Co.
Gulf Pulp & Paper Co.
Halifax Power & Pulp Co., Ltd.
Lotbinière Pulp & Paper Co., Ltd.
James Maclaren Co., Ltd.
Minas Basin Pulp & Power Co., Ltd.
Mohawk Corp., Ltd.
Quebec North Shore Paper Co.
Richmond Pulp & Paper Co. of Canada, Ltd.
St. George Pulp & Paper Co., Ltd.
St. Lawrence Corp., Ltd.
St. Raymond Paper, Ltd.
Soucy, F. F., Inc.
Thorold Pulp Co., Ltd.

Finland
Ahlström, A., Oy
Myllykosken Paperitehdas Oy
Stockfors Ab
Svarta Bruk, Oy, Ab
Toppila Oy

Japan
Taio Paper Mfg. Co., Ltd.

Norway
Aall-Ulefos Brug
S. D. Cappelen
Albert Collett (Salsbruket)
A/S Egelands Verk
Folla Tresliperi
Fossing Tresliperi A/S
Fostvedt A/S
Funnefoss Tresliperi
A/S Gjeving Traesliperi
Helge-Rein-By Brug, A/S
A/S Kammerfos Bruk
A/S Kistefos Traesliperi
Lövenskiold-Fossum
A/S Namdalens Traesliperi
A/S Risor Traemassefabriker
Rygene-Smith & Thommesen
Sande Tresliperi, A/S
A/S Skrankefos Traesliperi
A/S Songe Traesliperi
A/S Statlandsbruket
Tinfos Papirfabrik
A/S Traelandsfos
Treschow-Fritzoe
A/S Tronstad Brug Ltd.
A/S Vafos Brug
A/S Vittingfoss
Viul Tresliperi, A/S

Portugal
Companhia Portuguesa de Celulose

Sweden
Bure A/B
Forsse Woodpulp Mill
Hogfors Trasliperi, A/B
Iggesunds Bruk, A/B
Marma-Långrörs A/B
Rockhammars Bruks A/B
Rottneros Bruk, A/B
Scharins-Soner A/B
Slottsbrons Träförädlings A/B
Svenska Cellulosa A/B

Switzerland
Fabrique de Pâtes de Bois de la Doux

United States
American Wood Board Co.
Arizona Pulp & Paper Co.
Scott Paper Co., Hollingsworth & Whitney Div.
Tomahawk Pulp Co.
Washington Pulp and Timber Co.

ESPARTO, BLEACHED

France
L'Alfa S. A.
La Cellulose du Rhône

STRAW, BLEACHED

Italy
Cartiere Burgo S.p.A.

The Netherlands
Coop. Stroocartonfabriek "DE EENDRACHT"
N. V. Stroostoffabriek "PHOENIX"
N. V. Maatschappij tot Stroveredeling "SOVE"

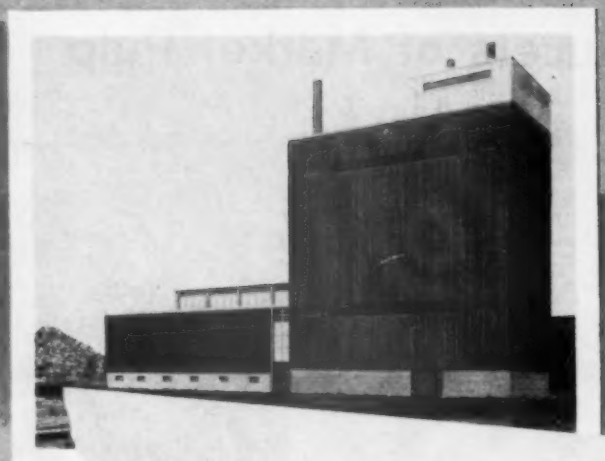
SCREENINGS

Canada
Canadian International Paper Co.
Gaspesia Sulphite Co., Ltd.
Great Lakes Paper Co., Ltd.
Gulf Pulp & Paper Co.
St. Raymond Paper, Ltd.

Finland
Kajaani Oy
Oy Wilh. Schauman AB
Veitsiluoto Oy (V. L.)

Sweden
Svenska Cellulosa A/B

United States
Brown Company



MARKET WOOD PULP

FIRST QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

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	U.S.	Canadian	Swedish	Finnish	Norwegian
	$82.50/ 90.00	$82.50/ 90.00	$90.00/ —	$90.00/ —	$90.00/ —
	97.50/100.00	97.50/100.00			
	$140.00/150.00	$140.00/150.00	150.00/ —	150.00/ —	150.00/ —
Hdwd.	135.00/140.00		140.00/ —		
ached.	130.00/140.00				
	117.50/125.00	125.00/ —	125.00/130.00	125.00/ —	
	$135.00/140.00	$135.00/140.00	140.00/ —	140.00/ —	140.00/ —
ed.	135.00/ —				
	/—	125.00/ —	125.00/ —	125.00/ —	125.00/ —
	/135.00	140.00/ —	134.00/ —		
		130.00/135.00			

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a **NEW KRAFT** reaches the market

CHLORINE DIOXIDE BLEACHED FOR HI-BRIGHTNESS

To paper mills dependent upon market pulp, Penobscot, America's oldest market pulp mill, now offers a constant source of uniformly high quality pulp from America's newest kraft mill. The entire production of Penobscot's new $5 million plant addition will be available for market sale. The new spruce Softwood Kraft offers both strength and quick development. The new Penobscot Hardwood Kraft provides strength with high opacity and bulk. We invite correspondence with mills seeking a dependable source of domestic pulp.

PENOBSCOT CHEMICAL FIBRE CO.
Mills: Old Town, Maine
Sales Offices: 211 Congress Street,
Boston 10, Massachusetts – LIberty 2-3870

Penobscot / MARKET PULPS

MADE IN THE U.S.A. SOFT & HARDWOOD SULPHITE • SOFT & HARDWOOD KRAFT • SODA • GLASSINE SULPHITE • GLO-WHITE PULP

World Producers of Market Pulp

Compiled especially by PULP & PAPER magazine. Listings following company names and addresses give type of pulp and brand names. All grades are softwood unless otherwise specified.

AUSTRIA

Arland Papier- und Zellstoff-Fabriken AG
Graz-Andritz, Styria
Mill at: Rechberg, Carynthia
Sulfite, bleached and unbleached
Soft and hardwood high yield pulps

Brigl & Bergmeister AG
Niklasdorf/Mur, Styria
Sulfite, bleached and unbleached

Frantschach Zellstoff- und Papierfabrik AG
Vienna 9, Berggasse 7
Mill at: Frantschach, Carynthia
Sulfate, unbleached

Hamburger, W.
Vienna 1, Mahlerstrasse 7
Mill at: Pitten, Lower Austria
Sulfite, bleached and unbleached
Semi-chemical

Holzstoff-Verkaufsstelle GmbH
Vienna 6, Gumpendorferstasse 6
Incorporates 25 groundwood mills
Groundwood

Kellner-Partington Paper Co. Ltd
Hallein bei Salzburg
Mills at: Hallein & Villach
Sulfite, bleached
Dissolving and related grades
Special grades
Brands: V.S.; Super V.S.;
Super A-1; A-1; etc.

Lenzinger Zellulose- und Papierfabrik AG
Lenzing/Upper Austria
Sulfite, bleached
Dissolving

Leykam-Josefsthal AG
Vienna 1, Parkring 2
Mill at: Gratkorn, Styria
Sulfite, bleached and unbleached

Nettingsdorfer Papier- und Sulfatzellulose-Fabrik AG
Nettingsdorf, Upper Austria
Sulfate, unbleached

Neusiedler AG
Vienna 1, Schottenring 21
Mills at:
Kematen
Weissenbach
Sulfite, bleached and unbleached

Pölser Zellulose- und Papierfabrik AG
Pöls bei Judenburg
Sulfite, unbleached and bleached

Steyrermühl AG
Vienna 1, Karntnerring 4
Mill at: Steyrermühl, Upper Austria
Sulfite, bleached and unbleached

St. Michael AG
Vienna 1, Singerstrasse 8
Mill at: Hinterberg nr. Leoben, Styria
Sulfite, bleached and unbleached

CANADA

Abitibi Power & Paper Co., Ltd.
408 University Ave., Toronto 2, Ont.
Mills at:
Sault Ste. Marie, Ont.
Smooth Rock Falls, Ont.
Sulfite, bleached and unbleached
Brand: Abitibi

Alliance Paper Mills, Ltd.
Merritton, Ont.
Sulfite, bleached
Special grades
Glassine
Tissue
Brand: Alliance

Anglo-Canadian Pulp and Paper Mills, Ltd.
10-16 Blvd. des Capucins, Quebec
Sulfite, unbleached
Brand: Anglocan

Anglo-Newfoundland Development Co. Ltd.
Grand Falls, Newfoundland
Sulfite, unbleached
Brand: A.N.D.

Bathurst Power & Paper Co., Ltd
Head office:
Bathurst, N.B.
Exec. offices:
635 Dorchester Blvd. W., Montreal 2, Que.
Sales organization: Bathurst Paper Sales Ltd. (sales company for all products of the Mills Division)
635 Dorchester Blvd. W., Montreal 2, Que.
1035 Hodge St., St. Laurent, Que.
1000 Gerard St., E., Toronto, Ont.
Mill at: Bathurst, N.B.
Groundwood
Brand: Bathurst

Bowaters Mersey Paper Co., Ltd
Liverpool, N.S.
Sulfite, unbleached
Standard grades

Bowater's Newfoundland Pulp & Paper Mills, Ltd.
Corner Brook, Newfoundland
Sulfite, unbleached
Standard grades

John Breakey, Ltd.
Breakeyville, Que.
Flash dried groundwood

British Columbia Forest Products, Ltd.
Crofton, B.C.
Sulfate, bleached and semi-bleached
Brand: Crofton Kraft

Canada Paper Co., Div. of Howard Smith Paper Mills Ltd.
2300 Sun Life Bldg., Montreal 2, Que.
Mill at: Windsor Mills, Que.
Groundwood
Sulfate, unbleached
Premium special grade
Brand: Windsor

Canadian Forest Products Ltd.

Howe Sound Pulp Division
Executive office:
999 W. Pender St., Vancouver 1, B.C.
Mill at: Port Mellon, B.C.
Sulfate, semi-bleached and unbleached

Canadian International Paper Co.
Sun Life Bldg., Montreal 2, Que.
Mills at:
Hawkesbury, Ont.
Gatineau, Que.
LaTuque, Que.
Temiskaming, Que.
Sulfite, bleached
Dissolving and paper grades
Sulfite, unbleached
Standard grades
Sulfite screenings
Sulfate
High Alpha, bleached and unbleached for specialty papers
Brands: Novocell; Tenacell; Filmcell; Acetacell; Plasticell; Photocell

Celgar Ltd. (Subsidiary of Columbia Cellulose Co.)
1030 West Georgia St., Vancouver 5, B.C.
Mill at: Castlegar, B. C.
Sulfate, bleached
Standard grades

Columbia Cellulose Co. Ltd.
1030 West Georgia St., Vancouver 5, B.C.
Mill at: Prince Rupert, B.C.
Sulfite, bleached
Dissolving and special grades

Consolidated Paper Corp., Ltd.
Sales office:
Consolidated Paper Sales, Ltd
Sun Life Bldg., Montreal, Que.
Mills at:
Port Alfred, Que.
Grand Mere, Que.
Cap de la Madeleine, Que.
Shawinigan Falls, Que.
Sulfate, unbleached

Donnacona Paper Co., Ltd.
2300 Sun Life Bldg., Montreal 2, Que.
Mill at: Donnacona, Que.
Sulfite, unbleached
Standard grades
Brand: Donnacona

Dryden Paper Co., Ltd.
Dryden, Ont.
Sulfate, bleached and unbleached
Brand: Dryden

Fraser Companies, Ltd.
Sales office:
1010 St. Catherine St. W., Montreal 2, Que.
Mills at:
Edmundston, N.B.
Newcastle, N.B.
Atholville, N.B.
General offices: Edmundston, N.B.
Sulfite, bleached
Standard grades
Sulfate, unbleached
Standard grades
Sulfite, unbleached
Standard grades

Gaspesia Sulphite Co., Ltd.
Chandler, Que.
Sulfite, bleached
Standard grades
Sulfite, unbleached
Glassine
Brand: Wonderwhite

PRICE & PIERCE

LIMITED

Established in 1869

WOOD PULP AGENTS

LONDON NEW YORK MONTREAL

The Great Lakes Paper Co., Ltd.
P.O. Box 430, Fort William, Ont.
Sulfite, unbleached
Standard grades
Sulfite screenings
Brand: Great Lakes

Gulf Pulp & Paper Co.
65 St. Anne St., Quebec, Que.
Mill at: Clarke City, Que.
Groundwood—pressed wet
Special unbleached
Standard unbleached
Screenings
Brand: Gulf

Halifax Power & Pulp Co. Ltd.
Sheet Harbour, Nova Scotia
Groundwood
Flash dried standard unbleached

Howard Smith Paper Mills Ltd.
2300 Sun Life Bldg., Montreal 2, Que.
Mill at: Cornwall, Ont.
Sulfite, bleached
Standard grades
Soda
Bleached
Standard unbleached
Brands: Stormont; Seagull

Irving Pulp & Paper Ltd.
P.O. Box 280, Lancaster, N. B.
Sulfite, bleached
Prime grades
Sulfate, bleached
Prime grades
Brand: Irving

The KVP Co., Ltd.
200 Bay St., Toronto, Ont.
Mill at: Espanola, Ont.
Sulfate, bleached and unbleached

Lotbinière Pulp & Paper Co., Ltd.
Danville, Que.
Mill at: Nicolet Falls, Que.
Groundwood—unbleached (moist)
Standard grades—tissue and board
Brand: Lotbiniere

The James Maclaren Co., Ltd.
Buckingham, Que.
Sulfite, unbleached
Standard grades
Groundwood

MacMillan, Bloedel & Powell River Ltd.
1199 West Pender St., Vancouver, B.C.
Mill at: Harmac, B.C.
Sulfate, bleached, semi-bleached
Brand: Harmac
Mill at: Port Alberni, B.C.
Sulfate, semi-bleached
Brand: Alberni
Mill at: Powell River, B. C.
Sulfite, unbleached
Brand: Powell River

Marathon Corp. of Canada Ltd., Div. of American Can Co.
Sales office:
Menasha, Wis.
Mill at: Marathon, Ont.
Sulfate, bleached
Brands: Marathon Bleached Softwood Kraft; Marathon Bleached Hardwood Kraft

Minas Basin Pulp & Power Co., Ltd.
Hantsport, N.S.
Groundwood
Special bleached
Standard unbleached
Brand: Minas Basin

Mohawk Corp., Ltd.
P.O. Box 155, Rivière du Loup, Que.
Mill at: Rivière du Loup
Groundwood
Standard unbleached

North Western Pulp & Power Ltd. (Jointly owned by St. Regis Paper Co. and North Canadian Oils Ltd.)
Hinton, Alberta
Sales office:
St. Regis Paper Co., New York, N.Y.
Sulfate, bleached
Brand: Alberta Hi-Brite

Ontario Paper Co., Ltd.
Thorold, Ontario
Sulfite, unbleached
Brand: Opco

Quebec North Shore Paper Co.
Head Office:
680 Sherbrooke St. W., Montreal, Que.
Sales Office:
Ontario Paper Co., Ltd., Thorold, Ont.
Mill at: Baie Comeau, Que.
Sulfite, unbleached
Special grades
Standard grades
Groundwood
Standard unbleached

Rayonier Canada Ltd.
Mills at:
Port Alice, B.C.
Sulfite, bleached
Paper and dissolving grades
Woodfibre, B.C.
Sulfate, bleached
Paper grades

Richmond Pulp & Paper Co. of Canada, Ltd. (Part of the Kruger Organization)
Bromptonville, Que.
Semi-chemical
Groundwood
Standard unbleached
Brand: Richmond

St. George Pulp & Paper Co., Ltd.
Mill at: St. George, N.B.
P.O. Box 218, St. George, N.B.
Groundwood
Bleached
Unbleached
Brand: Fibrewhite

St. Lawrence Corp., Ltd.
Sales office:
St. Lawrence Sales Co., Ltd.
Sun Life Bldg., Montreal, Que.
Mills at:
Dolbeau, Que.
East Angus, Que.
Nipigon, Ont.
Red Rock, Ont.
Three Rivers, Que.
Sulfite, unbleached
Standard grades
Bleachable grades
Sulfate, unbleached
Standard grades
Groundwood
Standard unbleached

St. Raymond Paper, Ltd.
Sales office:
St. Raymond Sales Ltd.
2100 Drummond St., Montreal 25, Que.
Mills at:
Desbiens, Que.
St. Raymond, Que.
Sulfite, unbleached
Special grades
Standard grades
Groundwood
Standard unbleached
Sulfite screenings
Newsprint
Brand: Metabetchouan

Soucy, Inc., F. F.
Chemin du Lac, Co. Temiscouata, Que.
Groundwood
Standard unbleached
Brand: Soucy; Snow Flake

Spruce Falls Power and Paper Co., Ltd.
2 Carlton St., Toronto 2, Ont.
Mill at: Kapuskasing, Ont.
Sulfite, bleached

Thorold Pulp Co., Ltd.
Front Street, Thorold, Ont.
Groundwood
Standard unbleached

Thurso Pulp & Paper Co.
Mill at: Thurso, Que.
Sulfate, bleached
Soft and hardwood
Brand: Thurso

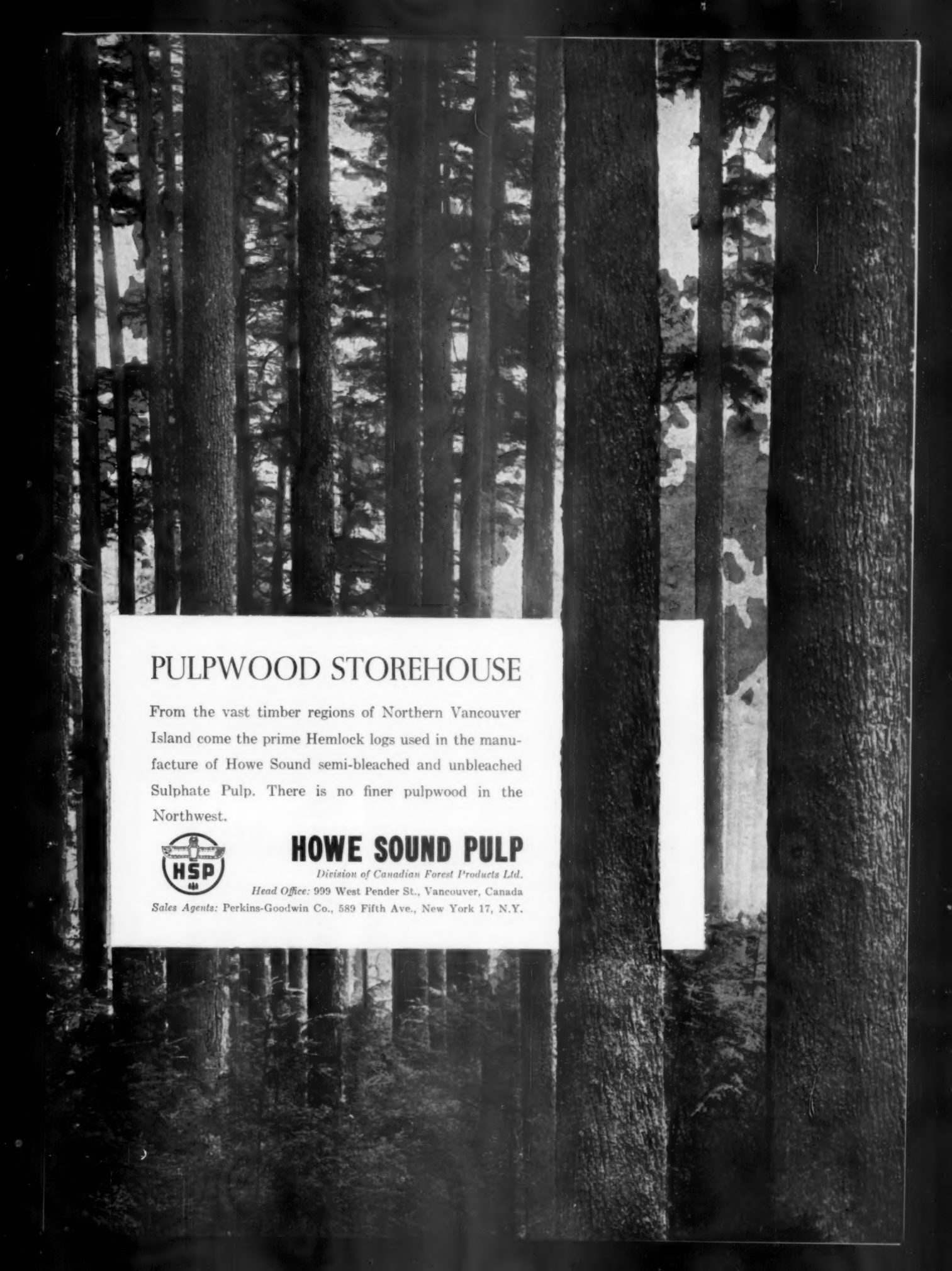
FINLAND

Ahlström, A., Oy
Mill at: Warkaus
Sulfite, unbleached
Special grades
Brands:
Ahlström Strong (Blue); Ahlström Strong Bleachable (Black); Ahlström Easy Bleaching (Red)
Mill at: Karhula
Wet groundwood
Brands: Karhula "SN", "S" and "SB"

Eklöf, Aug., Ab
Borga
Sulfite, unbleached
Standard grades
Brands: AEB easy bleaching (red); AEB bleachable (black); AEB strong (blue); AEB extra strong (green)

Enquist, J.W. Oy, (Sphinx)
Lielahti
Sulfite, bleached
Dissolving and special grades
Standard grades
Brands: Sphinx (Red) for Rayon; Sphinx (Red) Extra Soft; Sphinx (Black) Soft; Sphinx (Blue) Strong; also semi-prime, second and third qualities and dry and wet screenings.

Enso-Gutzeit Oy
Mills at:
Kaukopaa
Kotka
Tainionkoski
Sulfate, unbleached
Special grades
Standard grades
Brands: Seal BL (Black) Bleachable; Seal L & S (Black) Light & Strong; Seal (Blue) Kraft; Seal (Green) Kraft, Extra Strong; Gutzeit (Black) Light & Strong; Gutzeit (Blue) Kraft; Gutzeit (Green) Kraft, Extra Strong; also second qualities
Sulfate, bleached
Brand: Enso (Blue) Kraft; also second qualities
Sulfite, unbleached
Special grades
Brands: Torna (Red) Easy Bleaching; Torna (Black) for Greaseproof and Glas-



PULPWOOD STOREHOUSE

From the vast timber regions of Northern Vancouver Island come the prime Hemlock logs used in the manufacture of Howe Sound semi-bleached and unbleached Sulphate Pulp. There is no finer pulpwood in the Northwest.

HOWE SOUND PULP

Division of Canadian Forest Products Ltd.

Head Office: 999 West Pender St., Vancouver, Canada

Sales Agents: Perkins-Goodwin Co., 589 Fifth Ave., New York 17, N.Y.

sine; Torna (Blue) Strong; Torna (Green) Extra Strong

Haarlan Selluloosayhtio
Lievestuore
Sulfite, bleached
Standard grades—hardwood
Brands: Haarla Aspen (hardwood); Haarla Birch (hardwood)

Joutseno-Pulp Oy
Pulp
Sulfate, unbleached
Special grades
Standard grades
Brands: JsssP (Green) Extra strong; JsssP (Blue) Strong; also wet screenings

Kajaani Oy
Kajaani
Special grades
Standard grades
Brands: Kajaani CD Green, Kajaani CD Black, Kajaani CD Red, Kajaani Blue, Kajaani Black, Kajaani Red; also semi-prime qualities and dry screenings

Oy Kaukas Ab
Kaukas
Sulfite, bleached
Dissolving and special grades
Standard grades
Brands: KF One Crown; Two Crown, Three Crown; Four Crown for viscose; KF One A, Two A for Acetate; KF (Blue) Strong; KF (Black) Soft; KF (Red) Extra Soft; also second and third qualities

Kemi Oy
Kemi
Sulfite, unbleached
Special grades
Standard grades
Brands: Kemi (Green Strong; Kemi (Blue) Strong
Sulfate, unbleached
Special grades
Standard grades
Brands: Kemi OK Strong; Kemi Con (Condenser Paper), Kemi KA (Cable Paper)

Kymmene Aktiebolag
Kuusankoski
Sulfite, bleached
Brands: Kuusankoski CD Extra Strong Bond Special (Green); Kuusankoski CD Extra Strong Bond (Green)

Lohja-Kotka Oy
Lohja
Sulfate, unbleached
Standard grades
Brand: Lohja (Blue) Strong

Metsaliiton Selluloosa Oy
Aanekoski
Sulfite, bleached
Standard grades—soft and hardwood
Special grades
Brands: Aanekoski (Green) Extra Strong; Aanekoski (Blue) Strong; Aanekoski (Black) Soft; Aanekoski (Birch) Hardwood
Sulfate, bleached
Brands: Aanekoski CD (Pine); Aanekoski CD (Birch)

Myllykosken Paperitehdas Oy
Myllykoski
Wet groundwood
Brand: Myllykoski "K" and "KB" (bleached)

Nokia Ab
Nokia
Sulfite, unbleached
Special grades
Standard grades
Brands: Nokia (Green) E Extra Strong; Nokia (Blue) E Strong; Nokia (Black) E Bleachable

Oulu Oy
Oulu
Sulfate, unbleached
Special grades
Standard grades
Brands: Oulu (Green) Extra Strong; Oulu (Blue) Strong
Sulfate, semi-bleached
Brands: Oulu Polaris 55, 60, 65, 70, 75
Sulfate, bleached
Brands: Oulu Polaris Rex CD

Rauma Repola Oy
Rauma
Sulfite-soda, bleached
Dissolving and special grades
Brands: Rauma R, RR, RRR, for Rayon and C for Cord

Rosenlew W. and Co., Ab
Björneborg
Sulfite, bleached
Special and standard grades
Brands: Rosenlew VR, VS, J, VV, Alpha; F for photo; VP for parchment; Rosenlew (Black) Soft; Rosenlew (Blue) Strong; also semi-prime qualities

Oy Wilh. Schauman AB
Jakobstad
Sulfite, unbleached
Special grades
Standard grades
Brands: Jakobstad (Green) Extra Strong; Jakobstad (Green) G Glassine; Jakobstad (Blue) Strong; also semi-prime, second quality, dry screenings

Serlachius, G.A., Oy
Mantta
Sulfite, bleached
Special grades
Standard grades
Brands: G.S. (Blue) Strong; G.S. (Green) Extra Strong; G.S. (Green) G. Extra Strong Glassine
Sulfite, unbleached
Special grades
Standard grades
Brands: G.A.S. (Blue) Strong

Stockfors, Ab
Lovisa
Dry groundwood (in thin sheets)
Standard unbleached
Brand: Stockfors "F"

Sunila Oy
Sunila
Sulfate, unbleached
Special grades
Standard grades
Brands: Sunila (Green) Extra Strong; Sunila (Blue) Strong; Sunila 400; Sunila L&S Light and Strong; Sunila Special Washed
Sulfate, semi-bleached
Brand: Sunila (Semi-T)

Svarta Bruk, Oy, Ab
Svarta
Dry groundwood (in thin sheets)
Standard unbleached
Brand: Svarta "SA"

Toppila, Oy
Oulu-Uleåborg
Sulfite, unbleached
Standard grades—softwood, wet pulp & dry pulp
Brand: Toppila (Blue) Strong; also second and third qualities
Wet groundwood
Brand: Toppila

Veitsiluoto Oy (V.L.)
Veitsiluoto
Sulfite, bleached and unbleached
Standard grades
Brands: (Bleached) VL green (chlorine dioxide); VL blue (hypochlorite) (Unbleached) VL green Extra Strong; VL blue Strong

Yhtyneet Paperitehtaat Oy
Valkeakoski, P.O.B. 40
Mill at: Jämsänkoski
Sulfite, bleached
Brands: Ilves (Black) soft; Ilves (Blue) strong
Mill at: Valkeakoski
Sulfite, unbleached
Brands: Walkiakoski (Red) extra soft easy BL; Walkiakoski (Black) soft BL; Walkiakoski (Blue) strong

FRANCE

L'Alfa S.A.
Paris
Bleached esparto

Cellulose d'Aquitaine
St. Gaudens, Haute Garonne
Sulfate, bleached (hardwood)
Standard grades
Special grades

La Cellulose du Rhône
Tarascon
Sulfate, bleached
Soda esparto pulp

Sica, S.A.
Alizay
Dissolving

WEST GERMANY

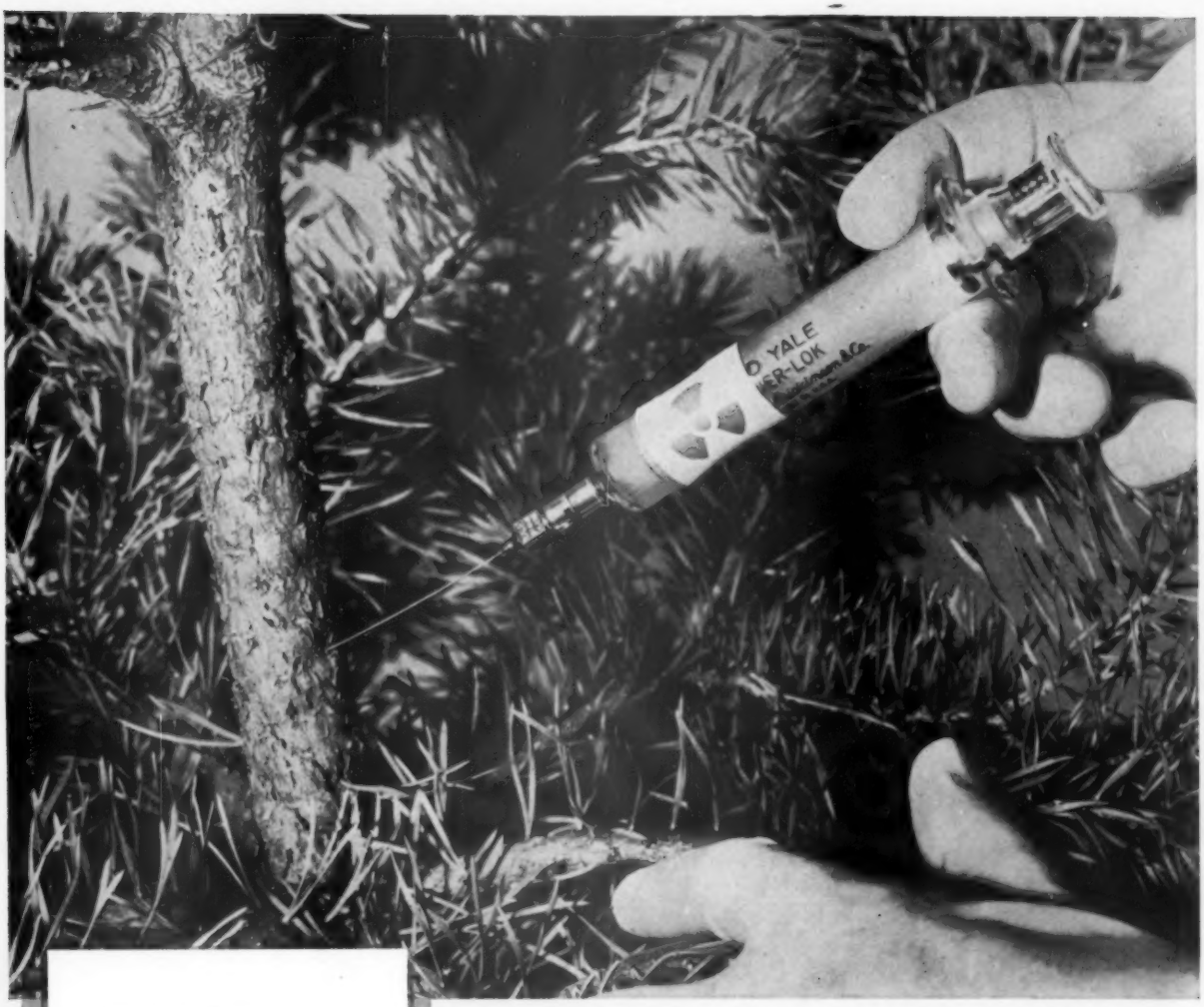
Aschaffenburger Zellstoffwerke AG
Redenfelden, Bavaria
Sulfite, bleached and unbleached
Standard grades
Paper grades, dissolving

Zellstofffabrik Waldhof
Mannheim-Waldhof
Sulfite, bleached and unbleached
Soft and hardwood
Dissolving and related grades
Special grades
Standard grades
Sulfite, unbleached

ITALY

Cartiere Burgo S.p.A.
Piazza Solferino 11, Torina
Mill at: Ferrara
Strawpulp, bleached

research



THIS IS JBH

Use it for good opacity, high brightness, bulk and unusual cleanliness. Typical tests unbeaten: Canadian Standard Freeness 689; Opacity 77.8; Tear 0.85; Mullen 15; G.E. Brightness 88%.

Rayonier Research, called the most comprehensive in the industry, starts with the seedling (as in radioactive tagged-atom studies shown in above photo), presses on to customer end-products. From this come the great paper-making pulps and the big advances such as found in our bleached hardwood kraft, JBH.

This intensive work at three large, modern research centers supports our customers . . . is at their beck and call to insure maximum results from our complete line of sulfites and krafts.

So when you need paper-making pulps, call in Rayonier.

RAYONIER

GREAT PAPER-MAKING PULPS

Rayonier Incorporated
161 East 42nd Street
New York 17, New York

World's Most Complete Line of Paper-Making Pulps: Western hemlock bleached sulfites; western softwood bleached sulfates; western red cedar bleached sulfates; southern pine bleached sulfates; southern hardwood bleached sulfates; southern pine bleached sulfites.

JAPAN

Hokuetsu Paper Mills Co., Ltd.
4, 3-chome, Hongokucho, Nihombashi, Tokyo
Sulfate, bleached
Sulfite, unbleached

Hyogo Pulp Industry Co., Ltd.
20 4-chome, Minami-Honcho, Higashi-ku, Osaka
Sulfate, bleached

Kokoku Rayon and Pulp Co., Ltd.
1 1-chome, Shiba-Tamura-cho, Minato ku, Tokyo
Sulfite, bleached
Dissolving grades
Standard grades

Kokusaku Pulp Industry Co., Ltd.
8 1-chome, Yuraku-cho, Chiyoda-ku, Tokyo
Sulfite, bleached and unbleached
Sulfate, bleached and unbleached
Dissolving grades
Standard grades

Nagoya Pulp Co., Ltd.
1 4-chome, Horiuchi-cho, Nakamura-ku, Nagoya
Sulfate, bleached and unbleached

Nippon Pulp Industry Co., Ltd.
New Marunouchi Bldg., Tokyo
Mill at: Yonago, Tottori-ken
Sulfate, bleached
Standard grades
Dissolving grades
Mill at: Nichinan, Todaka, Miyazaki-ken
Sulfite, bleached
Dissolving grades
Standard grades
Brand: White "A"

Sanyo Pulp Co., Ltd.
Marunouchi, Chiyoda-ku, Tokyo
Mills at:
Iwakuni
Gotsu
Sulfite, bleached and unbleached
Dissolving grades
Paper grades
Kraft, bleached and unbleached
Brands: DP (Viscose); DPP (Plastic); DPE (Cellophane); DPH (High pulp); DPT (Low Pulp); PP (Paper pulp)

Taiko Paper Mfg. Co., Ltd.
10 Kamiyokowari, Fuji City, Shizuoka Pref.
Branch office:
Yushima Bldg. No. 1-4 chome Yushima, Bunkyo-ku, Tokyo
Sulfate, unbleached
Special grades

Taio Paper Mfg. Co., Ltd.
655, Mishima-cho, Iyo-Mishima City, Ehime Pref.
Sulfite, unbleached
Sulfate, bleached and unbleached
Groundwood
Semichemical, bleached, unbleached

Takahagi Pulp Co., Ltd.
18 2-chome, Marunouchi, Chiyoda-ku, Tokyo
Sulfate, bleached and base paper

Tohoku Pulp Co., Ltd.
2 1-chome, Marunouchi, Chiyoda-ku, Tokyo
Mill at: Akita
Sulfite, bleached and unbleached
Dissolving grades
Standard grades
Mill at: Ishinomaki
Sulfite, bleached and unbleached
Standard grades
Kraft, bleached

Toyo Pulp Co., Ltd.
c/o Tekko Bldg., 1 1-chome, Marunouchi, Chiyoda-ku, Tokyo
Sulfate, unbleached

Tsurusaki Pulp Co., Ltd.
Dojima Bldg., 50, Kinugasa-cho, Kita-ku, Osaka
Kraft, unbleached and bleached

THE NETHERLANDS

Coop. Stroocartonfabriek "DE EENDRACHT" G.A.
Appingedam
Bleached Monosulfite straw pulp
Brand: A 1

N.V. Stroostoffabriek "PHOENIX"
Veendam
Bleached sulfate straw pulp, dry
Brand: Phoenix "Superior"

N.V. Maatschappij tot Stroveredeling "SOVE"
Arnhem
Bleached Celdecor-Pomilio straw pulp, dry
Brand: Sove

NORWAY

Aall-Ulefos Brug
Ulefoss
Groundwood, wet

Borregaard, A/S
Sarpsborg
Sulfite, bleached
Dissolving and related grades
Special grades
Standard grades
Brands: VS; Super VS Super A 1; Super A 1 Photo; Super A 1 Photo Soft; Super Plast

S. D. Cappelen
Ulefoss
Groundwood, wet

Albert Collett (Salsbruket)
Johan Collett
Oslo
Groundwood, wet

A/S Egelands Verk
Söndeled p.a.
Mill at: Söndeled near Risör
Groundwood, dry and wet

Folla Tresliperi
Follafoss
Groundwood, wet

Fostvedt A/S
Holt pr. Tvedestrand
Groundwood (aspen and spruce)

Funnefoss Tresliperi
Skarnes
Groundwood, wet

Greaker Cellulosefabrik A/S
Greaker
Sulfite, bleached
Special grades
Standard grades
Brand: Greaker Sunshine

A/S Gjeving Traesliperi
Gjeving per Lyngor
Groundwood, wet

Gulskogen Cellulosefabrik A/S
Drammen
Sulfite, unbleached

A/S Helge-Rein-By Brug
Byafossen
Groundwood, wet

Katfos Fabriker, A/S
Geithus
Sulfite, unbleached

A/S And. H. Kiaer & Co., Ltd.
Torp
Sulfate, unbleached
Standard grades
Brand: Torp

A/S Kammerfos Bruk
Vadfoss
Groundwood, flash-dried

A/S Kistefos Traesliperi
Drammen
Groundwood, wet

Krogstad Cellulosefabrik A/S
Mjöndalen
Sulfite, bleached
Standard grades

Lövenskiold-Fossum
Fossum pr. Skien
Mill: Myren Tresliperi
Groundwood

Lövenskiold-Vaekero
Tofte i Hurum
Sulfate, bleached and unbleached

Mathiesen-Eidsvold Vaerk
Bön
Sulfite, bleached
Dissolving grades
Standard grades
Brands: Eidsvold Pulp Super 1 (E.P. Super I); Eidsvold Pulp Normal (E.P. Normal); E.P.P.; E.P.P.S.

Mjöndalen Cellulose A/S
Mjöndalen
Sulfite, bleached
Standard grades
Special grades
Brands: "BA"; "BAS"; "BAS-G"; "BAS-T"

A/S Namdalens Traesliperi
Owner: A/S Van Severen & Co., Ltd., Namsos (Post: Namsos; goods Lauvsnes)
Groundwood, hotground white

A/S Risor Traemassefabriker
Risor
Groundwood, wet

Rygene-Smith & Thommesen
Arendal
Groundwood, wet

Sande Tresliperi, A/S
Sande
Groundwood, wet

Saugbrugsforeningen
Halden
Sulfite, bleached
Dissolving grades
Brands: C.D. Extra
Super I; C.D. Extra
Special (normal grades)

ALL BASIC TYPES: SOUTHERN BLEACHED SULPHITE, SOUTHERN KRAFT-Bleached, SOUTHERN HARDWOOD-Bleached

SCOTT PAPER

Contact the Pulp Division, Scott Paper Company, International Airport, Philadelphia 13, Pennsylvania for carload or truck delivery

A/S Skrankefos Traesliperi
Fall st., S. Land
Groundwood, wet
Extra fineground and news

A/S Songe Traesliperi
Songe
Groundwood, wet
Brand: SONGE

A/S Statlandsbruket
Nord-Statland
Groundwood, wet

Tinfos Papirfabrik
Notodden
Groundwood
Brand: TP, Hot Ground

Tofte Cellulosefabrik A/S
Oslo
Sulfite, bleached
Longfibered, Softwood
Special grades
Standard grades

Toten Cellulosefabrik A/S
Nygaard Station
Gjövikbanen
Sulfite, bleached
Standard grades
Brands: Toten TTT Prime Bleached

A/S Traelandsfos
Kvinesdal
Groundwood, wet

Treschow-Fritzoe
Larvik
Groundwood, wet

A/S Tronstad Brug Ltd.
Tronstad, Lier
Groundwood, wet

A/S Vafos Brug
Vadfoss
Groundwood, wet

A/S Vestlandske Treforedling
Vadheim
Semi-chemical

Vestfos Cellulosefabrik A/S
Vestfossen Railway Station
Vestfossen
Sulfite, bleached
Special grades
Standard grades

A/S Vittingfoss
Oslo
Groundwood, wet

Viul Tresliperi, A/S
Viul Station
Hönefoss
Groundwood, dry and wet

PORTUGAL

Caima Pulp Co., Lda.
Avenidas dos Aliados, 211-6°. 6°.,
Porto
Sulfite, bleached (Eucalyptus)
Semi-bleached

Companhia Portuguesa de Celulose
Rua Castilho, 90-50-Lisboa
Mill at: Cacia
Sulfate, bleached, semi-bleached and unbleached, soft and hardwood
Groundwood

SWEDEN

Bäckhammars Bruk A/B
Bäckhammar
Sulfate, unbleached
Brand: Bäckhammar Three Star Kraft

Bengtsfors Sulfitaktiebolag
Bengtsfors
Sulfite, bleached
Standard grades
Brands: Bengtsfors Prime B 1.
Dissolving and related grades
Brands: Corona Super I; Corona Super II; Corona USA

Bergvik och Ala A/B
Söderhamn
Sulfite, bleached
Brands: Superwhite S (softwood, spruce); Superwhite G (glassine grade, spruce); Superwhite H (hardwood, birch)
Sulfite, unbleached
Brands: Bergvik S, Circle S, G (Mitscherlich grades)
Sulfate, unbleached
Brands: Sandarne Prime, Circle, Star

Billerud A/B
Säffle
Sulfite, bleached and unbleached
Standard grades
Dissolving grades
Brand: Billerud Eagle

Bure A/B
Burea
Groundwood, dry
Brand: Bure

Dynäs A/B
Väja
Sulfate, unbleached
Brands: Dynas; Dynas Chlorine No. 5

Eds Cellulosafabriks A/B
Eds Bruk
Sulfate, unbleached
Special grades
Brands: Eds Two Stars Soft A: Light & Strong Kraft

Edsvalla Bruk, A/B
Edsvalla
Sulfite, bleached
Dissolving and related grades
Special grades
Standard grades
Brands: Edsvalla VS; Edsvalla Super VS, Edsvalla Superaceta

Fiskeby A/B
Skärblacka-Ljusfors Mills
Sulfite, unbleached
Sulfate, unbleached

Forss A/B
Köpmanholmen
Sulfate, bleached
Special grades
Standard grades
Sulfate, unbleached
Special grades
Brands: Forss MB, Forss HL
Sulfite, bleached
Standard grades
Viscose
Brands: Forss Star

Forsse Woodpulp Mill
Oesterforse
Groundwood
Special unbleached dry

Hellefors Bruks A/B
Hellefors
Sulfite, strong and easy bleaching
Brands: HB Strong; HB EB

Hissmofors A/B
Krokom
Sulfite, bleached
Standard grades
Brand: Elkhead

Hogfors Trasliperi, A/B
Häggenäs
Groundwood
Special unbleached
Standard unbleached

Hylte Bruks A/B
Hyltebruk
Sulfite, bleached
Special grades
Standard grades
Brands: Hylte HBA Prime bleached sulfite

Iggesunds Bruk, A/B
Iggesund
Sulfite, bleached
Standard grades
Sulfate, bleached
Special grades
Standard grades
Groundwood
Brands: Special, Imperial Anchor, White Anchor Lux, Silver Anchor, Golden Anchor

Katrinefors A/B
Mariestad
Sulfite, unbleached
Semichemical
Brand: Katrinefors

Klippans Finpappersbruk A/B
Klippan
Mills at:
Böksholm
Lessebo
Sulfite, bleached, soft and hardwood

Kopparfors A/B
Ockelbo
Sulfate, bleached
Special grades
Super grades
Standard grades
Sulfate, unbleached
Special grades
Brands: Norrland One Star; Norrland Three Star; Norrland Four Star

Korsnäs A/B
Gävle 2
Sulfite, bleached
Dissolving grades
Chlorine dioxide bleached paper grades
Sulfate, bleached
Chlorine dioxide bleached paper grades
Sulfate, semi-bleached, unbleached
Brands: Kosnäs Silk, Super I and Normal grade; Roburwite Extra, Prime Mitscherlich Sulfite; Roburwite MS, Medium Strong Sulfite; Korsnäs Tissue, bleached Sulfite; Vigorwite Extra bleached Kraft; Manila 58, Manila 68, semi-bleached Kraft; Korsnäs Kraft, unbleached Sulfate

Mackmyra Sulfit A B
Mackmyra
Sulfite, unbleached

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Special grades
Brands: MS; M

Marma-Langrörs A/B
Söderhamn
Mill at: Marmaverken
Sulfate, semi-bleached and unbleached
Brand: Lj Kraft
Mill at: Vallvik
Sulfite, bleached and unbleached
Brands: Lj White Crown; Lj Polar Bear Birch; and Lj Crown
Mill at: Lottefors
Groundwood, dry white
Brand: L
Mill at: Järpen
Groundwood, dry white fineground
Brand: J

Mo och Domsjö A/B
Main office: Ornsköldsvik
Sales office: Strandvagen 1, Stockholm
Mill at: Husum
Sulfate
Prime bleached soft and hardwood paper grades
Brands: Husum Extra White Prime Bleached; Husum White Birch Prime Bleached
Mills at:
Domsjö
Hornefors
Sulfite
Prime bleached soft and hardwood paper grades
Special grades
Dissolving grades
Brands: White Horse Strong Prime Bleached; White Horse Greaseproof Prime Bleached; White Horse Blend; White Horse 2919; Silverleaf Birch Prime Bleached; White Aspen Special Prime Bleached; Modophane; Modocell; Modosilk; Modosilk Extra; Modosilk Super; Modofoto; Modoplast; Modolint

Molnbacka-Trysil, A/B
Forshaga
Sulfite, bleached
Dissolving and related grades
Standard grades
Brands: Forshaga VS; Forshaga Super VS; Forshaga "F:Haga" and "F:Haga ST"

Munkedals A/B
Munkedal
Sulfite bleached
Standard grades, soft and hardwood
Brands: Munkedal SGR; SAB

Munksjö A/B
Jönköping
Sulfate, bleached
Standard grades
Brand: Aspa

Oskarström Sulphite Mills A/B
Oskarstrom
Sulfite
Brands: Easy bleaching TT; Strong PP

Rockhammars Bruks A/B
Sällinge
Groundwood, moist
Brand: Rockhammar

Rottneros Bruk, A/B
Sales office:
Slottsbron
Mill at: Rottneros
Groundwood, wet
Brand: Crowned R

Sandvikens Cellulose A/B
Sandviken
Sulfate, unbleached
Special grades
Brands: S Crown S; Special Cable

Scharins-Soner A/B
Clemensnas
Groundwood
Standard unbleached—dry
Brand: Skelleftea

Skogsagarnas Cellulosa A/B
Monsteras
Sulfate, semi-bleached, unbleached
Brand: The Key Brand

Slottsbrons Träförädlings A/B (subsidiary of Rottneros Bruk)
Slotsbron
Groundwood, wet
Brand: Slottsbron
Softwood
Brands: Crown ROS; Crown, ROS

Statens Skogsindustrier, A/B
Box 540, Stockholm 1
Mill at: Karlsborgs Bruk, Karlsborgverken
Sulfate, bleached and unbleached
Brands: Royal Bl. Kraft; Royal Kraft

Stjernfors-Ställdalen A/B
Ställdalen
Sulfite, unbleached
Standard grades
Brand: Ställdalen SS

Stora Kopparbergs Bergslags A/B
Falun
Sulfite, bleached (Stora 59)
Super grade
Sulfate, bleached (Stora 32)
Super grade
Sulfate, bleached birch (Stora 61)
Super grade
Brands: Stora 59; Stora 32; Stora 61

Storviks Sulfit A/B
Ockelbo
Sulfite, unbleached
Special grades
Super grades
Brands: Storvik HS Extra Prime Strong Unbleached Mitscherlich Sulfite; Storvik Strong Unbleached Mitcherlich Sulfite HS_2

Ströms Bruks A/B
Stromsbruk
Sulfite, bleached
Dissolving and related grades
Standard grades from spruce, aspen and birch
Brand: Strom

Svano A/B
Svanobruk
Sulfite, unbleached
Special grades
Standard grades
Brands: White Swan; White Swan EB; H; S

Svenska Cellulosa A/B
Sundsvall
Sulfite, bleached
Dissolving and paper grades
Sulfite, unbleached
Sulfate, bleached and unbleached
Groundwood, moist
Brands: Sulfite, bleached, dissolving grades: Pulpcose, Pulpcose Crown
Sulfite, bleached, paper grades: Svartvik Select (Book grade), Svartvik Bond (Bond grade), Essvik 3 Stars (Book grade), Essvik Select (Book grade), Essvik G (Glassine grade), Essvik Birch
Sulfite, unbleached: Kramfors AA (Strong), Kramfors Puritan (Glassine grade), Kramfors 3 Crowns (Easy-bleaching)
Sulfate, bleached: Ostrand W91 (Pine), Ostrand X93 (Birch)
Sulfate, unbleached: Nensjo, Obbola
Groundwood, moist; Lulea

Uddeholms A/B
Uddeholm
Mill at: Skoghall near Karlstad
Sulfite, bleached
Dissolving and related grades
Special grades
Standard grades
Sulfate, bleached
Dissolving and related grades
Special grades
Standard grades
Brands: Betula; Alba; Ultra; Raya; Lintra; Bl 452; Excelsa; Carta; Cordicel; V-pulp; White Kraft

Utansjö Cellulosa A/B
Utansjö
Sulfite, unbleached
Brands: U Crown S, U Crown S STRONG, PRIME; USB, USB STRONG, Half Prime; USS Second Quality; USU Refined Screenings

Wifstavarfs A/B
Vivstavarv
Sulfite bleached and unbleached
Sulfate, unbleached
Brands: Superior; Prime Strong No. 170; Prime Strong Standard No. 160 and 135

Wikmanshytte Bruks A/B
Wikmanshyttan
Dissolving
Brands: Thurbo

SWITZERLAND

Cellulosefabrik Attisholz AG vorm. Dr. B. Sieber
Luterbach
Sulfite, bleached and unbleached

Dozière S.A., Fabrique de cellulose
Delémont
Semi-chemical

Fabrique de Pâtes de Bois de la Doux
St.-Sulpice
Groundwood

Papierfabrik Perlen
Perlen
Sulfite, bleached and unbleached

UNITED STATES

Alaska Lumber & Pulp Co.
Mill at: Sitka, Alaska
Sulfite, bleached
Dissolving grades
Standard grades

American Wood Board Co.
Schuylerville, N.Y.
Groundwood
Standard, unbleached

Arizona Pulp & Paper Co.
Flagstaff, Ariz.
Dry unbleached groundwood

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Bowaters Carolina Corp.
Mill at: Catawba, S.C.
Sulfate, bleached, semi-bleached and unbleached

Bowaters Southern Paper Corp.
Mill at: Calhoun, Tenn.
Sulfate, semi-bleached

Brown Co.
General Sales Office:
150 Causeway St., Boston 14, Mass.
Branch Offices:
500 Fifth Ave., New York 36, N.Y.
Prudential Plaza, Chicago 1, Ill.
681 Market St., San Francisco, Calif.
Montreal (Brown Forest Products Ltd.)
Castle Bldg., 1410 Stanley St.
Mill at: Berlin, N.H.
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Screenings, sulfite, sulfate
Brands: Solka; Solka Soft P.P.Q.; Solka Soft Alpha; Solka Dur Sylvan; Solka Dur Natus; Solka Special Dur Albas; Solka Floc

Brunswick Pulp & Paper Co.
Mill at: Brunswick, Ga.
Sulfate, bleached
Grades--pine, hardwood
Brand: Brunswick

Buckeye Cellulose Corp.
General Sales Office:
2899 Jackson Ave., Memphis 8, Tenn.
Mill at: Foley, Fla.
Sulfate, bleached
Dissolving grades
Paper grades

Champion Paper & Fibre Co.
Executive Office: Hamilton, O
Mills at:
Hamilton, O.
Canton, N.C.
Pasadena, Texas
Sulfate, bleached
Semi-bleached
Bleached-hardwood
Brands: Dixie ClO_2 Prime Bleached Sulfate; Lone Star Prime Semi-Bleached Sulfate; Prime Bleached Hardwood Sulfate

Chesapeake Corp. of Virginia
West Point, Va.
Sulfate, unbleached
Standard grades
Brands: Chesapeake Prime Unbleached Kraft and Chesapeake Prime Unbleached Kraft (soft cook)

Container Corp. of America
Main Office:
38 S. Dearborn St., Chicago 3, Ill.
Mill at: Brewton, Ala.
Bleached hardwood
Bleached pine
Sulfate, bleached
Brand: Brewton

Coosa River Newsprint Co.
Coosa Pines, Ala.
Sulfate, bleached

Crown Zellerbach Corp.
Executive Office:
One Bush St., San Francisco 19, Calif.
Mills (cellulose) at:
Bogalusa, La.
Camas, Wash.
Lebanon, Ore.
Los Angeles, Calif.
Port Angeles, Wash.
Port Townsend, Wash.
St. Helens, Ore.
West Linn, Ore.
Sulfite, bleached and unbleached
Sulfate, bleached and unbleached

East Texas Pulp & Paper Co.
Evadale, Texas
Sulfate, bleached
Soft and hardwood
Brand: Eastex

Eastern Fine Paper and Pulp Division, Standard Packaging Corp.
Executive Office:
Bangor, Me.
Mills at:
Lincoln, Me.
South Brewer, Me.
Sulfite, bleached
Sulfate, bleached
Soft and hardwood
Brand: Purocell

Georgia-Pacific Paper Co.
Main office:
Equitable Bldg., Portland, Ore.
Mill at: Toledo, Ore.
Sulfate, unbleached

Gulf States Paper Corp.
Gulf States Pulp Sales Division, Demopolis, Ala.
Mill at: Demopolis, Ala.
Sulfate, bleached
Soft and hardwood
Brand: Lo Thermo

Halifax Paper Co. Inc. (division of Albemarle Paper Mfg. Co.)
Roanoke Rapids, N.C.
Sulfate, partially bleached
Sulfate, unbleached
Standard grades
Brande: Albemarle

Hollingsworth & Whitney, Div. Scott Paper Co.
Front and Market Sts., Chester, Pa.
Mills at:
Madison, Me. (Groundwood)
Mobile, Ala. (Sulfate)
Sulfate, bleached and semi-bleached

International Paper Co.
Executive Office:
220 E. 42nd St., New York 17, N.Y.
Mills at:
Natchez, Miss.
Springhill, La.
Sulfate, bleached and unbleached
Standard grades
Dissolving grades
Brands: Novocell; Tenacell; Supercell

Ketchikan Pulp Co.
General office:
300 Laurel St., Bellingham, Wash.
Mill at: Ketchigan, Alaska
Sulfite, bleached
Dissolving grades
Standard grades

Marathon Southern Corp. (subsidiary of Marathon, Div. of American Can Co.)
Sales office:
Menosha, Wis.
Mill at: Naheola, Ala.
Sulfate, bleached
Brands: Naheola Bleached Hardwood Kraft; Naheola Bleached Softwood Kraft

The Mead Corp.
Mill at: Kingsport, Tenn.
Soda, bleached
Brand: Mead

New York & Pennsylvania Co.
425 Park Ave., New York 22, N.Y.
Mill at: Willsboro, N.Y.
Soda, bleached

Owens-Illinois Mill Div.
(formerly National Container Corp.
Executive Office:
405 Madison Ave., Toledo, O.
P.O. Box 1035, Toledo 1, O.
Mills at:
Big Island, Va.
Jacksonville, Fla.
Jaite, O.
Tomahawk, Wis.
Valdosta, Ga.
Sulfate, unbleached
Standard grades

Oxford Paper Co.
Executive Office:
230 Park Ave., New York 17, N.Y.
Mill at: Rumford, Me.
Sulfate, bleached and unbleached
Hardwood
Brand: Harbrite

Penobscot Chemical Fibre Co.
Executive and sales office:
211 Congress St., Boston, Mass.
Mill at: Old Town, Me.
Sulfite, chlorine dioxide bleached paper grades, softwood and hardwood glassine grade, softwood
Soda, chlorine dioxide bleached
Sulfate, hardwood chlorine dioxide bleached
Sulfate, softwood chlorine dioxide bleached
Brand: Penobscot bleached

Potlatch Forest, Inc.
Lewiston, Ida.
Sulfate, bleached

Puget Sound Pulp and Timber Co.
Bellingham, Wash
Sulfite, bleached

Rayonier Inc.
Executive & general sales office:
161 E. 42 nd St., New York 17, N.Y.
Mills at:
Fernandina Beach, Fla
Hoquiam, Wash
Jesup, Ga.
Port Angeles, Wash
Shelton, Wash.
Chemical cellulose
Sulfite, bleached standard paper grades
Sulfate, bleached standard paper grades
Soft and hardwood
Brands: Cellunier; Cordenier; Ethylose; Florianier; Hicolor; Nitration Cellulose; Purayonier; Rayaceta; Raybrite; Rayocord-X; Rayofiber; Rayselect; Special Acetate Cellulose; Tokusufu; Ultranier; Alphanier; Fibrenier; Georgianier; JBH; Raybond; Rayphoto; Snowhite

Riegel Paper Corp.—Carolina Div.
Executive office: 260 Madison Ave. New York, N.Y.
Mill at: Acme, N.C.
Bleached softwood and hardwood kraft
Brands: Albacel and Astracel

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A/S Krogstad Cellulosefabrik, *Bleached Sulphite*

A/S Tofte Cellulosefabrik, *Bleached Sulphite*

A/S Toten Cellulosefabrik, *Bleached Sulphite*

A/S Viul Tresliperi, *Dry Groundwood*

GERMANY:

Zellstofffabrik Waldhof, "*Beechopake*" *Hardwood Sulphite*

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The Ontario Paper Co., Ltd., *Unbleached Sulphite—Groundwood*

The Mohawk Corp. Ltd., *Groundwood*

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Standard grades

St. Regis Paper Co.
Executive office:
150 E. 42nd St., New York 17, N.Y.
Mill at: Tacoma, Wash.
Sulfate, bleached and unbleached
Superstandard grades
Brand: Tacoma

Scott Paper Co.
West Coast Division
Everett, Wash.
Manager of Pulp Sales
R. M. Heath
Scott Paper Co.
Chester, Pa.
Sulfite, bleached
Dissolving and related grades
Standard grades
Brand: Soundview

Spaulding Pulp and Paper Co.
Newberg, Ore.
Sulfite, unbleached
Standard grades

Tomahawk Pulp Co.
Tomahawk, Wis.
Branch office:
115 S. Superior St., Appleton, Wis
Groundwood
Fine tissue grades
Toweling and free board
Grades to specifications

Washington Pulp and Timber Co
Longview, Wash.
Groundwood, unbleached

West Virginia Pulp and Paper Co.
Executive office:
230 Park Ave., New York 17, N.Y
Mills at:
Mechanicville, N.Y
Tyrone, Pa.
Williamsburg, Pa
Luke, Md.
Covington, S.C.
Charleston, S.C.
Sulfate, unbleached

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200 S. Michigan Ave., Chicago, Ill.
681 Market St., San Francisco, Calif
Mills at:
Cosmopolis, Wash.
Everett, Wash.
Longview, Wash.
Springfield, Ore.
Sulfite, bleached
Dissolving and related grades
Standard grades
Sulfate, bleached
Standard grades
Special grades

YUGOSLAVIA

Fabrika Celuloze i Papira
Prijedor
Sulfite, bleached and unbleached
Standard grades

Fabrika Celuvoze I Papira "Duro Salaj"
Videm-Krško
Sulfite, bleached and unbleached
Standard grades

Tvornica Sulfatne Celuloze I Natron Papira
Maglaj
Sulfate, unbleached
Standard grades

Fabrika Sulfitne Celuloze Medvode
Medvode
Sulfite, bleached and unbleached
Standard grades

Zagrebacka Tvornica Papira
Zagreb
Sulfite, bleached and unbleached
Standard grades

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Cross Index of North American Agents and Importers by Companies

Producers of market pulp are shown in boldface type. Where an agent is listed, see preceding directory of producers. Agents' individual listings may be found in succeeding directory of agents and importers.

AUSTRIA

Arland Papier- und Zellstoff-Fabriken AG
Brigl & Bergmeister AG
Frantschach Zellstoff- und Papierfabrik
Hamburger, W.
Holzstoff-Verkaufsstelle GmbH
Kellner-Partington Paper Pulp Co. Ltd
Borregaard Co., Inc.
Lenzinger Zellulose- und Paperfabrik AG
Leykam-Josefsthal AG
Nettingsdorfer Papierfabrik AG
Neusiedler AG
Pölser Zellulose- und Papierfabrik AG
Steyrermühl AG
St. Michael AG

CANADA

Abitibi Power & Paper Co., Ltd.
Mead Pulp Sales, Inc.
Alliance Paper Mills, Ltd.
Anglo-Canada Pulp and Paper Mills, Ltd.
Anglo Paper Products, Ltd.
Montmorency Paper Co., Inc.
Anglo-Newfoundland Development Co., Ltd.
Anglo Paper Products, Ltd.
Northeastern Paper Sales, Inc.
Bathurst Power & Paper Co., Ltd.
Bathurst Paper Sales Ltd.
Bowaters Mersey Paper Co., Ltd
The Bowater Paper Co., Ltd.
Bowater's Newfoundland Pulp & Paper Mills, Ltd.
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Joutseno-Pulp Oy
Pulp Sales Corp.
Kajaani Oy
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681 Market St., San Francisco, Calif.
United States
Weyerhaeuser Co., Pulp and Paperboard Div.

Woodpulp, Inc.
Chrysler Bldg., New York 17, N.Y.
Canada
James Maclaren Co., Ltd.
John Breakey, Ltd.
St. George Pulp & Paper Co.
F. F. Soucy Inc.
United States
Chesapeake Corp. of Virginia

PULPS for EVERY PAPER MAKING REQUIREMENT

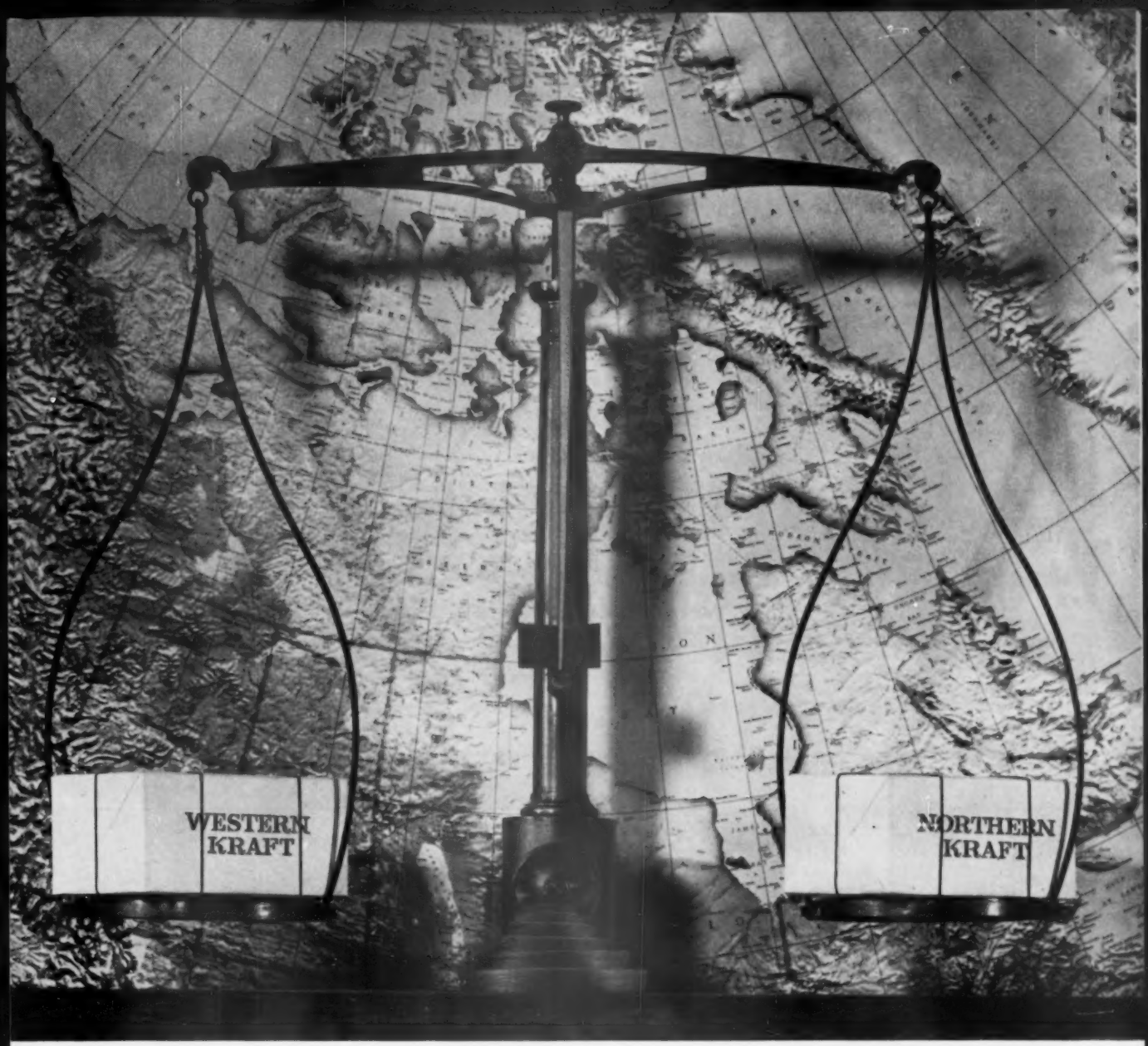
KORSNAS AKTIEBOLAG
BLEACHED SULPHITES
Roburwite Extra Prime Mitscherlich
Roburwite Medium Strong
RAYON PULP
Korsnas Silk Super I
Korsnas Silk, Normal
BLEACHED SULPHATES
Vigorwite Extra
Manila 58
Manila 68
UNBLEACHED SULPHATE
Prime Unbleached Kraft

MO & DOMSJO A. B.
BLEACHED SULPHITES
White Horse Strong
White Horse Greaseproof
White Horse 2919
White Horse Blend
Silverleaf Birch
White Aspen
White Aspen Special
Two Stage Cooked DPG 1800
RAYON PULPS
Dissolving & High Alpha Pulps for Rayon, Plastics, Photographic, Saturating & Specialties
BLEACHED SULPHATES
Husum Extra White Bleached Kraft
Husum White Birch

HYLTE BRUKS AKTIEBOLAG
BLEACHED SULPHITE
Hylte HBA Prime Bleached Sulphite

STORVIK SULFIT AKTIEBOLAG
UNBLEACHED SULPHITE
Storvik "HS" Extra Strong Mitscherlich
SEMI-BLEACHED SULPHITE
Storvik 70 Birch

Pagel, Horton & Co., Inc.
347 Madison Avenue, New York 17, N. Y.
ESTABLISHED 1916



CELGAR KRAFT HAS THE BALANCE

The outstanding feature of Celgar Kraft pulp is its balance of properties.

Because of the species blend in the Southern Interior of British Columbia, the Interior pulp resembles Northern Kraft pulps in many ways. It combines the outstanding tearing resistance of the West Coast fibres with the high bursting strength of Northern krafts over a wide range of freeness and in a variety of stock preparation equipment.

With this blend of qualities, Celgar Kraft is a premium pulp in almost any field of use.

V4427-1

COLUMBIA PULP SALES LIMITED has been formed to distribute Celgar Kraft pulps and Columbia Cellulose sulphite pulps. Offices are located at:
49 Old Bond St., London, S.W.1, England
1600 Dorchester St. West, Montreal 25, P.Q.

Celgar Kraft

PULP & PAPER

Directory of U.S. Rayon-Acetate Producers

Wood cellulose is a major raw material for all kinds of acetate and viscose fiber products. This list is compiled from Textile Organon, published by Textile Economics Bureau, Inc.

American Enka Corp. (rayon yarn, staple)
530 Fifth Ave., New York 36, N. Y.
Plants: Enka, N. C.
Lowland, Tenn.

American Viscose Corp. (rayon & acetate yarn & rayon staple & tow)
1617 Pennsyl. Blvd., Philadelphia 3, Pa.
Plants: Lewiston, Pa.
Meadville, Pa.
Front Royal, Va.
Nitro, W. Va.
Parkersburg, W. Va.

Beaunit Mills, Inc., American Bemberg and Coosa Pines Divisions (rayon yarn, staple & tow, cuprammonium)
261 Fifth Ave., New York 16, N. Y.
Plants: Childersburg, Ala.
Elizabethton, Tenn.

Celanese Fibers Co., Division of Celanese Corp. of America (rayon & acetate yarn, staple & tow)
180 Madison Ave., New York 16, N. Y.
Plants: Rome, Ga.
Cumberland (Amcelle), Md.
Rock Hill (Celriver), S. C.
Narrows (Celco), Va.

Courtaulds (Alabama) Inc. (rayon & other staple)
600 Fifth Ave., New York 20, N. Y.
Plant: LeMoyne, Mobile County, Ala.

E. I. du Pont de Nemours & Co., Inc., Textile Fibers Dept. (rayon & acetate yarn)
Wilmington 98, Del.
Plants: Old Hickory, Tenn.
Richmond (Ampthill), Va.
Waynesboro, Va.

Fair Haven Mills, Inc. (rayon monofilaments)
Plant: Fair Haven, Vt.

Hartford Fibres Co., Division of Bigelow-Sanford Carpet Co., Inc., (rayon staple)
140 Madison Ave., New York 16, N. Y.
Plant: Rocky Hill, Conn.

Hercules Powder Co. (polypropylene)
Wilmington, Del.
Plant: Covington, Va.

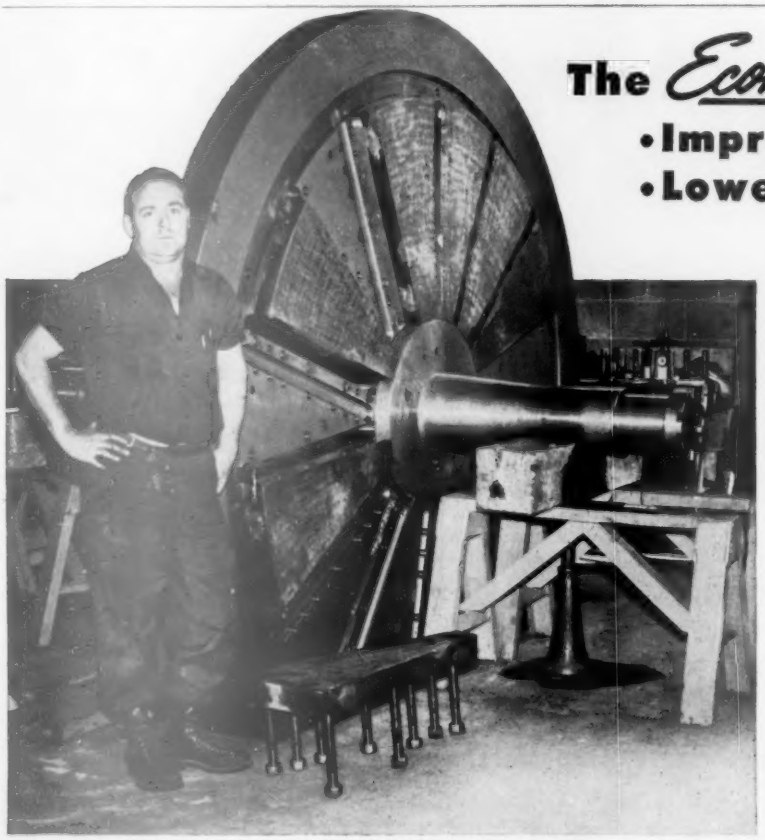
Industrial Rayon Co., Div. of Midland Ross Corp. (rayon yarn & tow)
Union Commerce Bldg., Cleveland 1, O.
Plants: Cleveland, O.
Painesville, O.

Mohasco Industries, Inc., New Bedford Rayon Div. (rayon yarn)
P. O. Box 908, New Bedford, Mass.
Plant: New Bedford, Mass.

North American Rayon Corp., Subsidiary of Beaunit Mills, Inc. (rayon yarn, staple & tow)
261 Fifth Ave., New York 16, N. Y.
Plant: Elizabethton, Tenn.

Skenandoa Rayon Corp., subsidiary of Beaunit Mill, Inc. (rayon yarn)
261 Fifth Ave., New York 16, N. Y.
Plant: Utica, N. Y.

Tennessee Eastman Co., Div. of Eastman Kodak Co. Marketer: Eastman Chemical Products Inc., Fibers Division (acetate yarn, tow & solution dyed staple)
Kingsport, Tenn.
Plant: Kingsport, Tenn.



The *Economical* Way to
•Improve Chip Quality
•Lower Chipping Costs

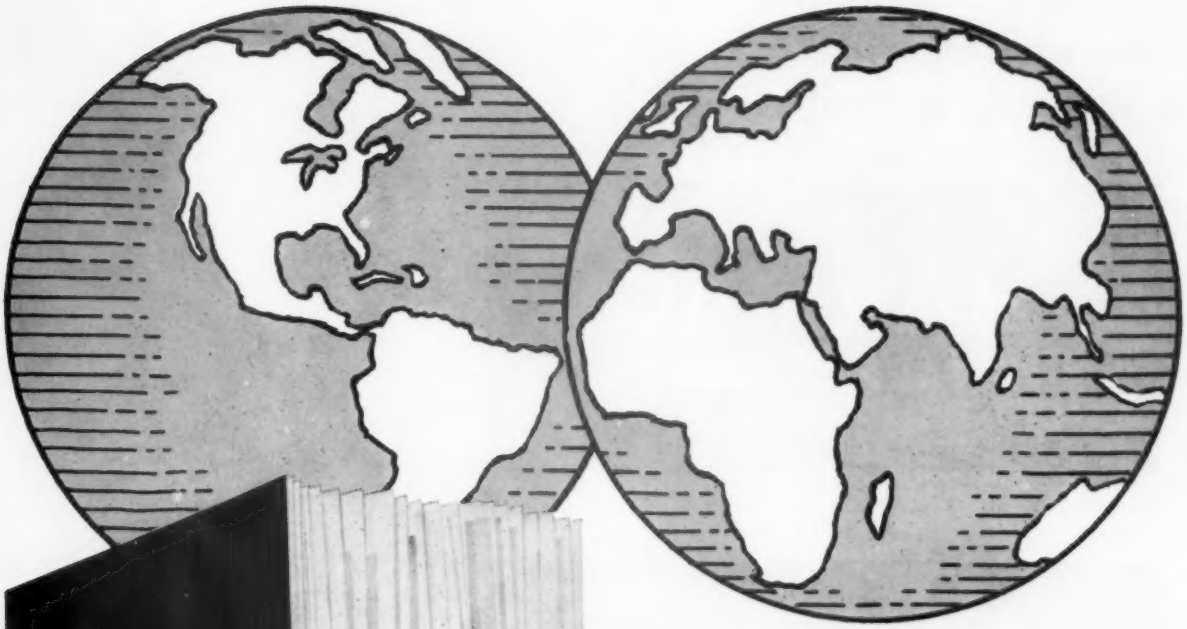
Equip your standard chipper with a Norman Disc

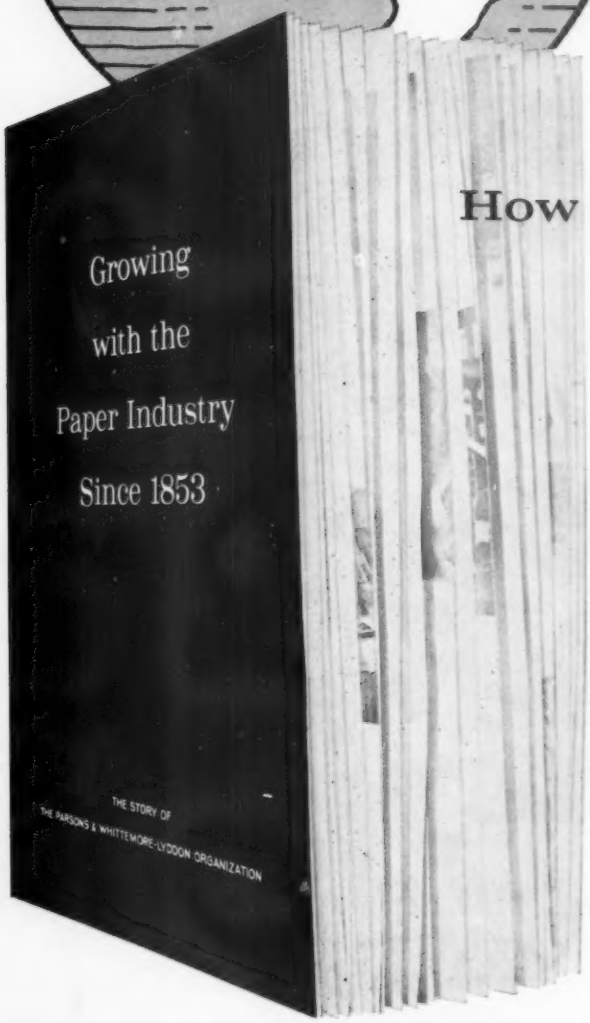
There's a good chance that your standard chipper can be equipped with a Norman disc. That means a high percentage of "to-size" chips, fewer compressed or bruised chips – and ½% to 1% less sawdust. That means a real saving. In addition, knives last longer and cost less.

You probably won't have to change the present foundation or conveyor.

It Will Pay You to Find Out!

CARTHAGE MACHINE CO.
CARTHAGE, NEW YORK





How Parsons & Whittemore develops Pulp and Paper Mill projects around the world

Business executives, industrialists and government officials often request information concerning the facilities and services of the Parsons & Whittemore/ Lyddon Organization.

To meet requests for such data, we have published a new, 40-page brochure which outlines the world-wide technical, financial, engineering and machinery-manufacturing facilities of the Organization. The booklet, which should prove especially valuable to those seeking to establish a paper industry in newly-developing countries, describes 25 pulp and paper mill projects recently completed or in course of completion, on four continents, using twelve different raw materials.

We shall be pleased to send you a free copy of "Growing with the Paper Industry Since 1853." Address your request to any of our offices listed below.

THE PARSONS & WHITTEMORE–LYDDON ORGANIZATION

World leaders in the development of pulp and paper mills for the use of local fibers

18-19 Savile Row, London W. 1, England

5 Rue Jean Mermoz, Paris 8°, France

250 Park Avenue, New York 17, N. Y.

HARMAC
BLEACHED KRAFT

ALBERNI
UNBLEACHED KRAFT

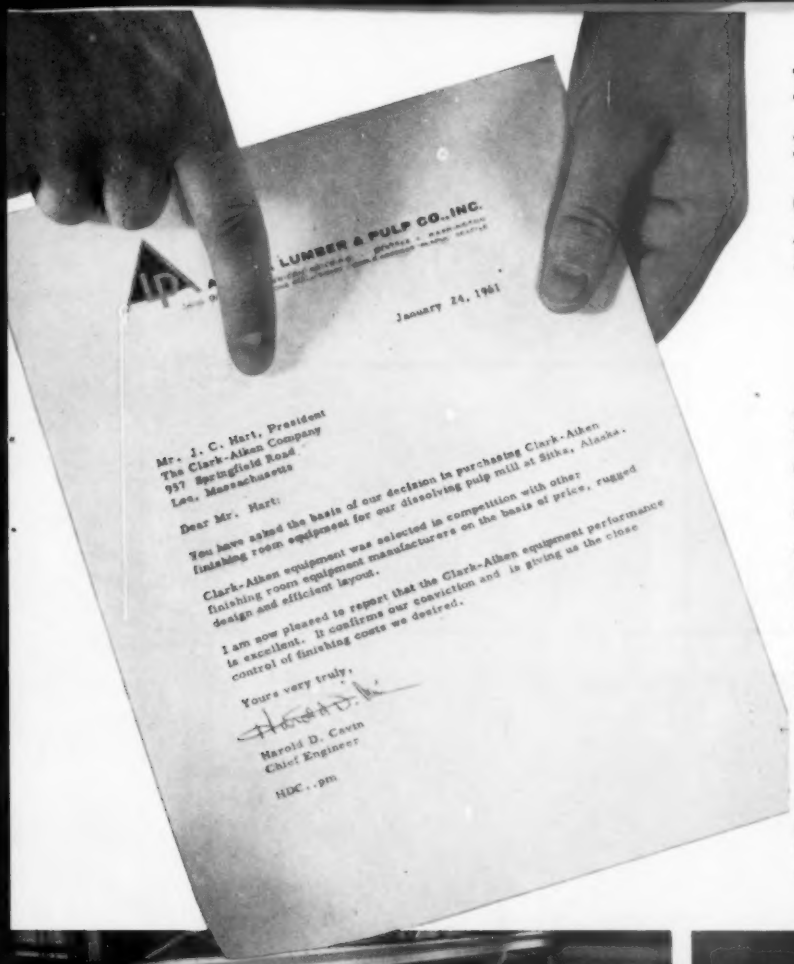
POWELL RIVER
UNBLEACHED SULPHITE

Strength, cleanliness and brightness plus dependability of supply ensure steady demand for these three grades among papermakers the world over. 350,000 tons of market pulp is manufactured yearly by

MacMILLAN, BLOEDEL AND POWELL RIVER LIMITED

1199 WEST PENDER STREET, VANCOUVER, B.C., CANADA

Sales Agents: PRICE AND PIERCE LIMITED
LONDON, NEW YORK, MONTREAL


LUMBER & PULP CO., INC.
January 24, 1961
Mr. J. C. Hart, President
The Clark-Aiken Company
957 Springfield Road
Lee, Massachusetts
Dear Mr. Hart:
You have asked the basis of our decision in purchasing Clark-Aiken finishing room equipment for our dissolving pulp mill at Sitka, Alaska.
Clark-Aiken equipment was selected in competition with other finishing room equipment manufacturers on the basis of price, rugged design and efficient layout.
I am now pleased to report that the Clark-Aiken equipment performance is excellent. It confirms our conviction and is giving us the close control of finishing costs we desired.
Yours very truly,
Harold D. Cavin
Chief Engineer
HDC:pm

HERE'S..."Control of finishing costs we desire" at the Alaska Lumber & Pulp Co. Inc.

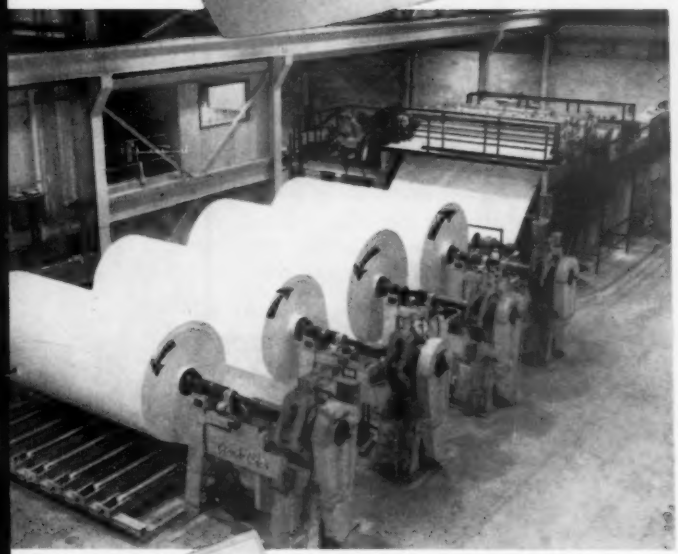
Clark-Aiken

PULP MILL EQUIPMENT can knock out high finishing costs for you too!

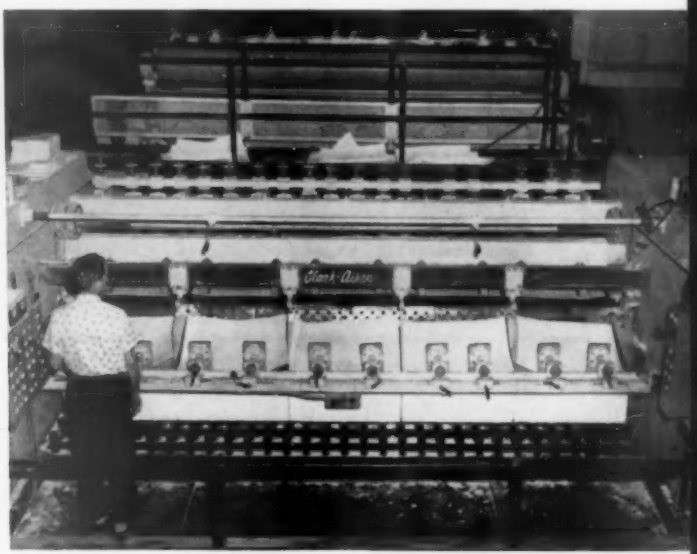
Controlled costs, improved production, reserve speed, uniform sheet lengths, easy maintenance, and many equipment innovations give recognition to the Sitka installation of Clark-Aiken pulp mill machinery as outstanding.

Satisfaction, as expressed in Mr. Cavin's letter, speaks the successful meeting of mill management desires and requirements — the engineering coordination and cooperation to achieve uncommon results.

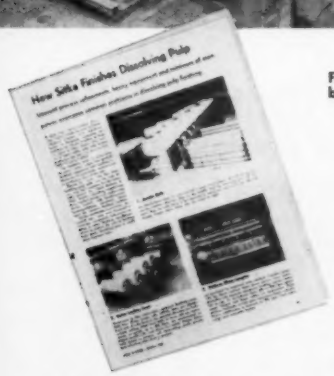
Clark-Aiken machinery is well known for its day-in and day-out reliable performance and unusual sturdiness . . . so, if you're looking for cost cutting opportunities, why not talk to Clark-Aiken now — explore the possibilities of equipment innovations for savings in your plant.



CUTTER LAYBOY FEED
Four 15-ton Jumbo rolls per charge for back-to-back cutting.



UNIFORM SHEET LENGTHS
Layboy tapes have speed of 200 to 800 FPM speed range. Variable speed drive. Heavy-duty construction.



Send for complete reprint story "How Sitka Finishes Dissolving Pulp."

The step-by-step progress of pulp from rolls to finished bales at Alaska Lumber and Pulp Co., showing Clark-Aiken equipment as used. Send for your copy today.

THE Clark-Aiken COMPANY

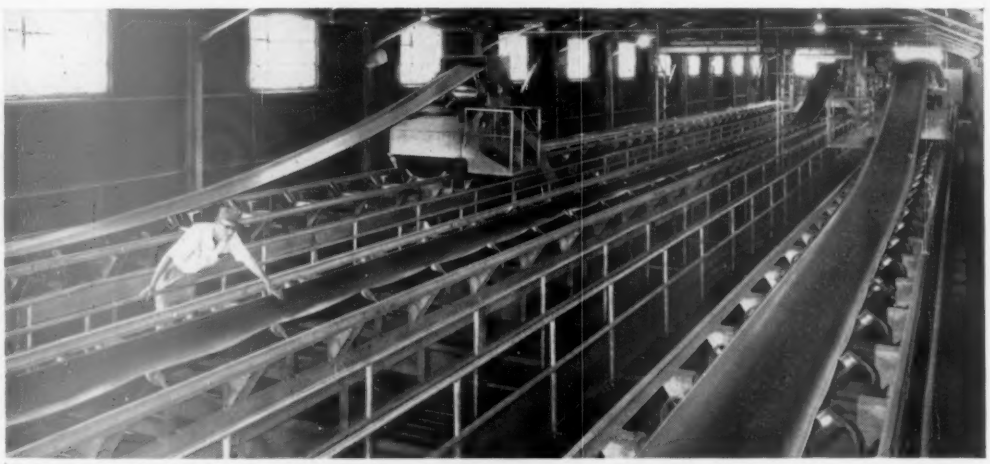
957 SPRINGFIELD ROAD

LEE, MASSACHUSETTS

CANADIAN REPRESENTATIVE: GORDON W. KEATES,
133 FLORA DRIVE, SCARBOROUGH, ONTARIO

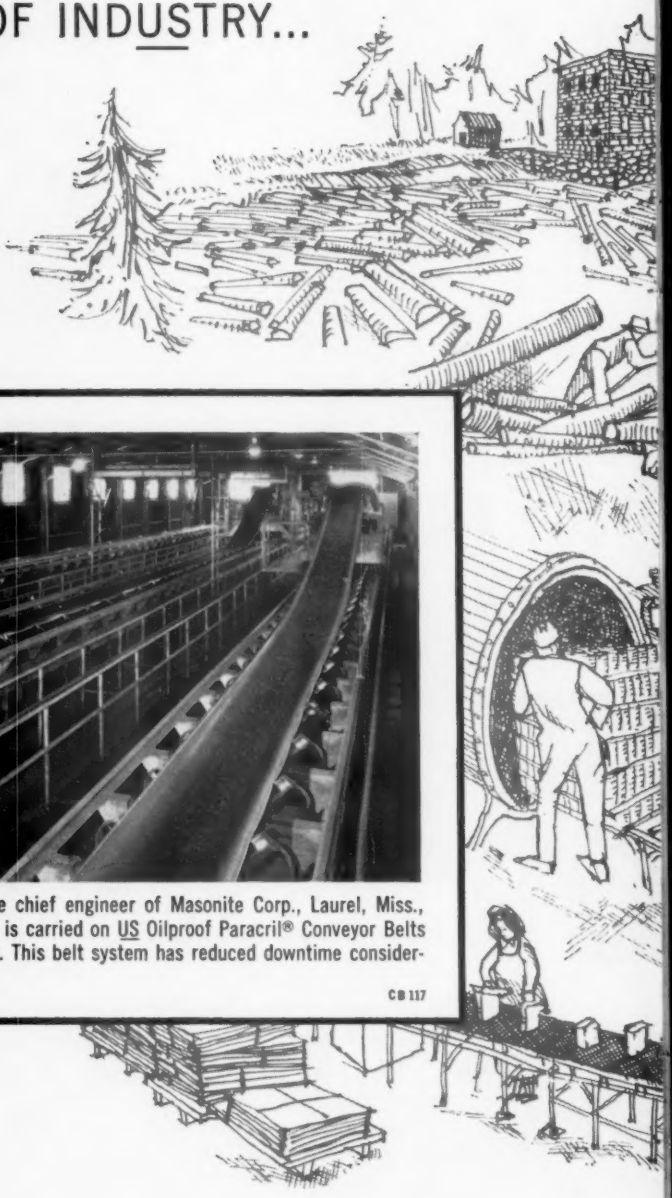
US RUBBER

AT THE HEART OF INDUSTRY...

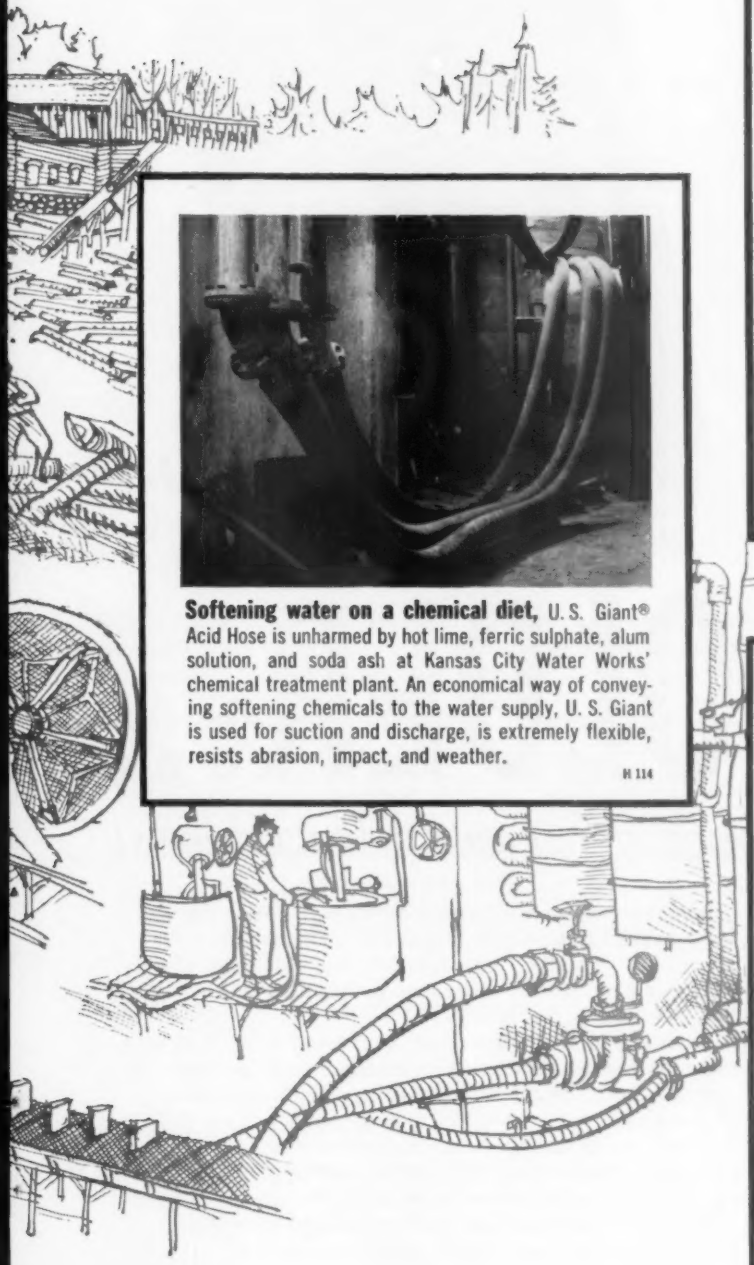


"We turn out 3,000,000 feet of board a day," reports the chief engineer of Masonite Corp., Laurel, Miss., "and our entire volume of wood chip required to fabricate the board is carried on US Oilproof Paracril® Conveyor Belts that operate 24 hours a day, 7 days a week over deep-trough idlers. This belt system has reduced downtime considerably, cut maintenance costs 25%."

CB 117

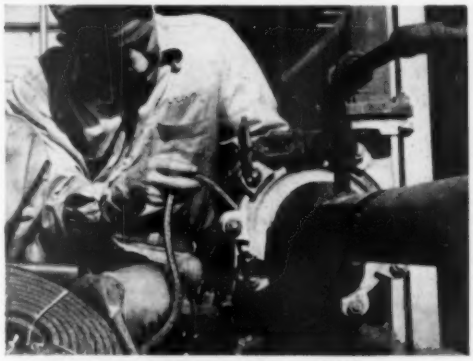


Processing industries of every kind find in US the superior industrial rubber product quality that keeps materials flowing—freely, efficiently, steadily. US is at the heart of industry because US knows industry and its needs...and serves those needs better.



Softening water on a chemical diet, U. S. Giant® Acid Hose is unharmed by hot lime, ferric sulphate, alum solution, and soda ash at Kansas City Water Works' chemical treatment plant. An economical way of conveying softening chemicals to the water supply, U. S. Giant is used for suction and discharge, is extremely flexible, resists abrasion, impact, and weather.

H 114



"Outlasted any other packing tested as much as 10 to 1," reported a large chemical plant about U. S. Solvent Packing, Style 414. Used on its caustic and solvent pumps, this US packing ended clean-up chores, increased production, reduced injuries due to leaks by 75%. Look beneath the surface and you'll find U. S. Rod and Sheet Packings sealing better, lasting longer, saving money throughout industry.

P 101

More than 6 times the life of other Variable Speed Belts, reports the Storm Lake, Iowa, plant of Hygrade Food. The first US Variable Speed Belt installed has already outperformed the previous belts by more than 6 to 1. What's more, it required no dressing or other maintenance and, unlike previous belts, has not developed uneven edge wear which shortens equipment life.

VSB 101

For every industrial rubber product need, turn to US. For Conveyor Belts, V-Belts, the original PowerGrip "Timing"® Belt, Flexible Couplings, Mountings, Fenders, Hose and Packings . . . custom-designed rubber products of every description. Discover why U.S. Rubber has become the largest developer and producer of industrial rubber products in the world. See your U.S. Rubber Distributor or contact US directly at Rockefeller Center, New York 20, N. Y.

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

United States Rubber

MECHANICAL GOODS DIVISION

SEND FOR THIS NEW FOLDER...

from the world's largest manufacturer of paper tubes and cores!

Personalized service is available from Sonoco plants coast to coast!

Here's a helpful, informative folder—yours for the asking. Tells all about Sonoco paper mill cores, Sonoco metal ends and paper mill core machinery. It's loaded with size charts, illustrations and technical data. Order your file copy today!

Sonoco's 60 years' experience is coupled with research and a completely integrated manufacturing operation to produce the high quality, dependable cores of today. They are made to exacting torque and crush strength specifications. Non-returnable cores; in all sizes. Returnable cores, with or without famous Sonoco metal ends, are made in all standard sizes.

Regardless of your core needs, you'll get more for your core dollar from Sonoco in service, quality and economy.

SONOCO
Paper Mill Cores

SONOCO PRODUCTS COMPANY, HARTSVILLE, SOUTH CAROLINA
• Mystic, Conn. • Akron, Ind. • Ravenna, Ohio • Lowell, Mass. • Holyoke, Mass. • Phillipsburg, N. J. • Longview, Texas • Philadelphia, Pa. • La Puente, Calif. • Fremont, Calif. • Atlanta, Ga. • Richmond, Va. • **MEXICO:** Mexico, D. F. • **CANADA:** Brantford, Ont. • Granby, Quebec

MAIL THIS TODAY!

SONOCO PRODUCTS COMPANY
Hartsville, South Carolina

Please send me the free descriptive folder on Sonoco paper mill cores.

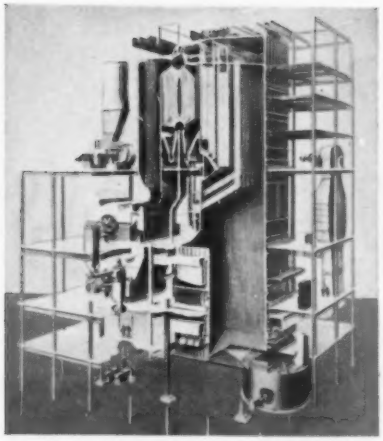
NAME_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

3065



Typical 2-drum C-E Recovery Unit for capacities exceeding 400 tons.

Reminder of...

FOUR FAMOUS FEATURES OF C-E RECOVERY UNITS

C-E Chemical Recovery Units are available in capacities presently running as high as 800 tons. Their high efficiency and availability are largely due to these exclusive C-E features:

1. **TANGENT-TUBE SUPERHEATER** – Tangent-tube panel construction sheds slag in a self-cleaning action. Slag falls to furnace floor directly beneath screen and superheater. Gas flows freely, at low velocities.
2. **CASCADE EVAPORATOR** *(coupled with electrostatic precipitator)* – Mechanically simple – requires a minimum of power and maintenance. Reliable, automatic controls maintain furnace stability over a wide range of liquor densities.
3. **WATERCOOLED DECANTING HEARTH** – Cooling causes a chilled layer of slag to form, protecting floor refractories from erosion. Hearth maintenance is eliminated! Molten slag decants through spouts placed several inches above the level floor.
4. **TANGENTIAL SECONDARY AIR** – Tangent air jets give gas mixture a turbulent, spiralling motion. Longer travel in furnace results. Combustion is rapid and complete, with reduced unburned char leaving furnace zone.

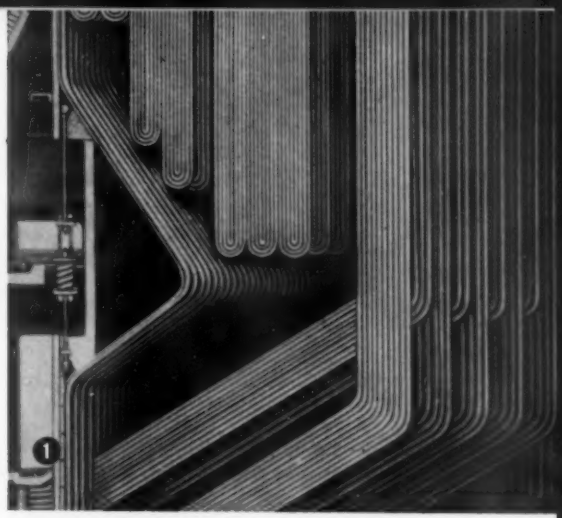
A 40-page catalog on C-E recovery units, bark burners and other boilers for the pulp and paper industry – as well as the answers to any of your specific questions – are available through the Paper Mill Division in Windsor or the C-E office nearest you. Inquiries are welcome.

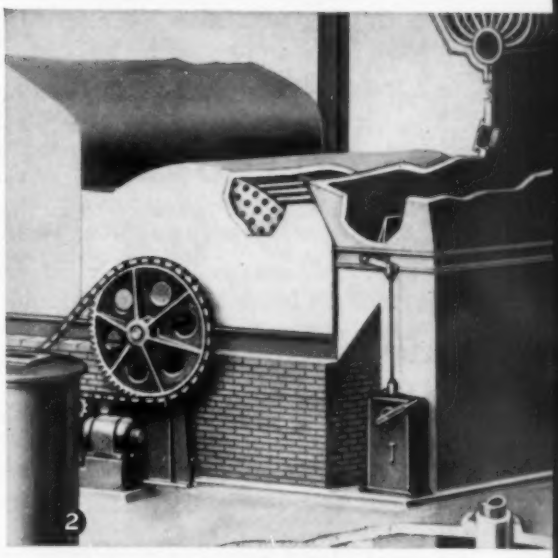
C-312

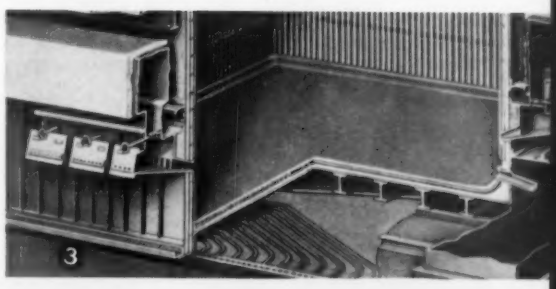
COMBUSTION ENGINEERING

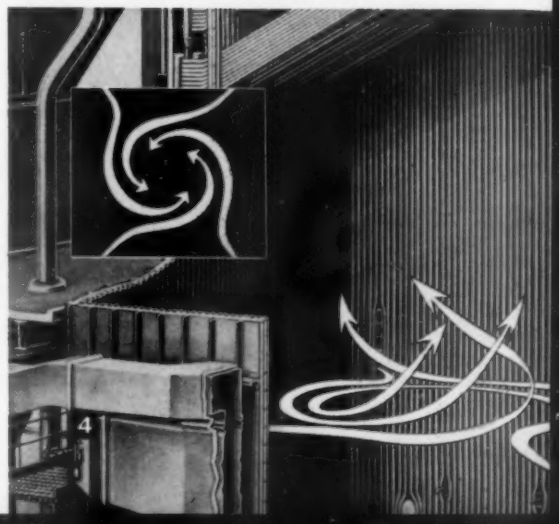
General Offices: Windsor, Conn.
New York Offices: 200 Madison Avenue, New York 16, N. Y.

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; SOIL PIPE









RCA introduces a cost-saving new

Electronic Paper Inspection System

for detecting creases, calender cuts, holes, spots and gloss imperfections

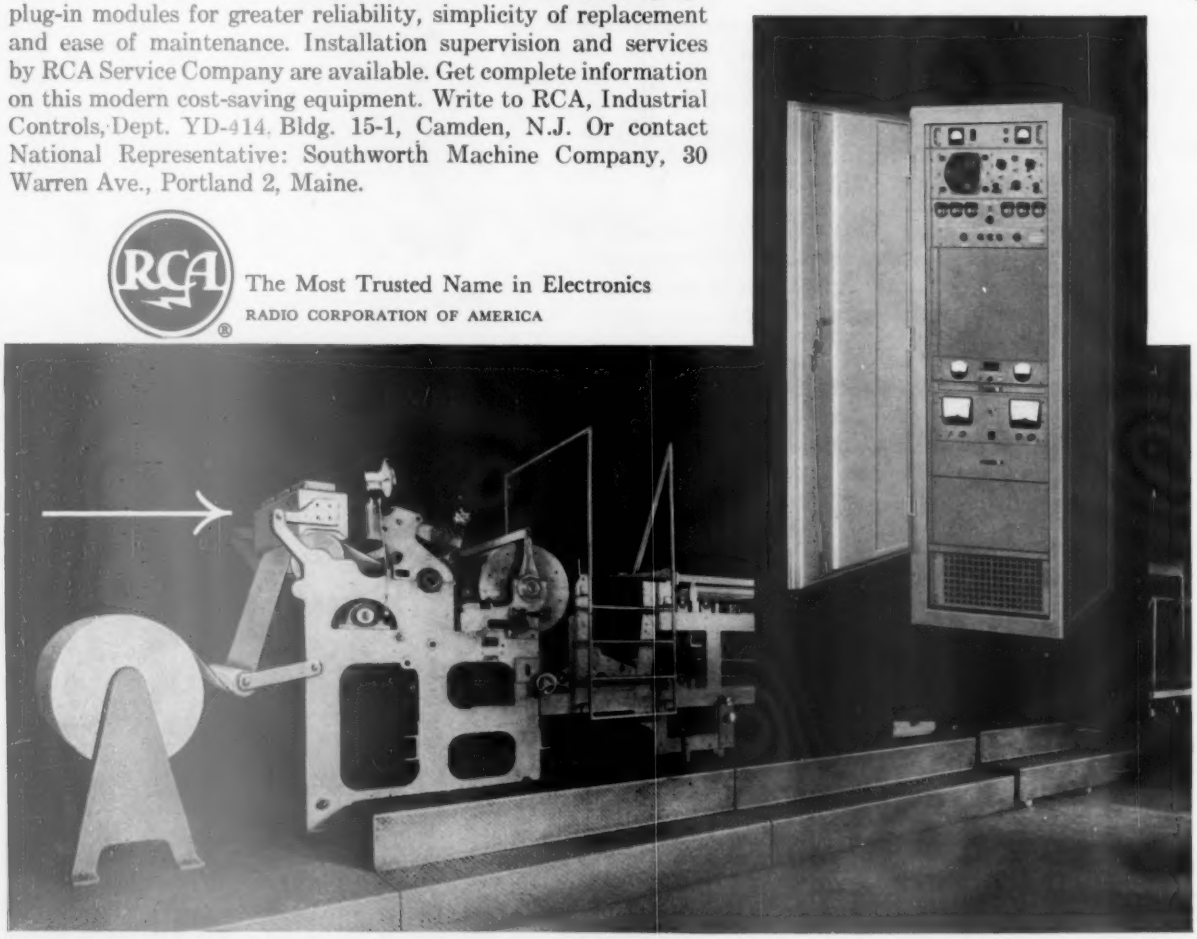
At least ten times faster than visual inspection, this new electronic equipment was developed by RCA to meet a need for automatically detecting and classifying imperfections in paper. Here is a quality control device which permits higher inspection speeds than ever before possible, with more consistent results, for maximum economy.

The surface of the paper is continuously monitored as it passes over a roller at linear speeds up to 1000 feet per minute. In this manner, creases, calender cuts, holes, spots, gloss imperfections, etc. are detected and the paper may be classified in such categories as "Accepts" and "Rejects," or "Firsts," "Seconds," and "Rejects," depending upon customer requirements.

This RCA equipment is completely transistorized and employs plug-in modules for greater reliability, simplicity of replacement and ease of maintenance. Installation supervision and services by RCA Service Company are available. Get complete information on this modern cost-saving equipment. Write to RCA, Industrial Controls, Dept. YD-414, Bldg. 15-1, Camden, N.J. Or contact National Representative: Southworth Machine Company, 30 Warren Ave., Portland 2, Maine.

- All controls mounted in one rack.
- At least 10 times faster than visual inspection —and far more consistent.
- Drift-free inspection standard.
- Only one head required for checking all types of defects.
- Non contact type inspection.
- Equipped with built-in lamp burn-out alarm system and test signal generator for checking performance of each channel at all times.

RCA The Most Trusted Name in Electronics
RADIO CORPORATION OF AMERICA



RCA Electronic Paper Inspection System installed before the cutter, and on a Maxson Sheet Handling Apparatus. Inspection head is indicated by arrow at left, control rack is shown at right. NOTE: Only one inspection head and one control rack are needed for detecting all types of defects. Control rack can be located remotely from inspection head.

FOR INFORMATION ON THIS OPTICAL PAPER INSPECTION SYSTEM WRITE

SOUTHWORTH MACHINE CO.

RCA NATIONAL REPRESENTATIVE, 287 WARREN AVENUE, PORTLAND, MAINE

The appointment by RCA as national representative for its Optical Paper Inspection Equipment marks another step in Southworth's objective of providing paper mill management with a comprehensive service aimed at cost reduction.

As you will read in RCA's story on the opposite page, this new equipment brings to the vital finishing room operation of inspection a speed and an accuracy heretofore unavailable because of human limitations and fallibility.

How you might incorporate RCA Optical Paper Inspection Equipment as part of a more efficient and completely integrated Southworth finishing room System is still another reason for considering an early Southworth study of your particular plant problems and requirements.

Paper Conditioners; Automatic Carton Sealer; Lift Tables; Air-Lift Tables; Cutters; Deliveries; Layboys; Skid Turners; Hand, Foot, Motor Driven Punching Machines; Humidifiers; Envelope Presses; Punch Heads; Tabbing Knives; Corner Cutters; Custom Built Allied Equipment.

You won't want to miss the...

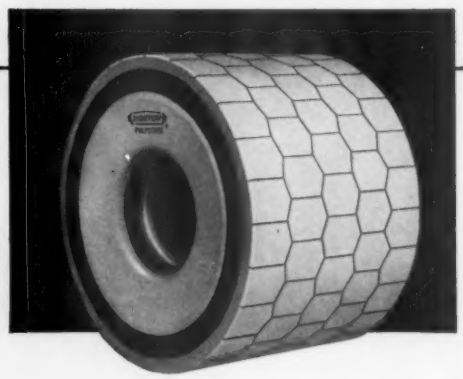
4th International MECHANICAL PULPING CONFERENCE

Edgewater Beach Hotel · Chicago, Illinois, U.S.A.
September 19, 20 and 21, 1961

Norton personnel from all over the world will be there to discuss the latest developments and techniques such as pitless grinding, higher speeds, and in general, how to get the most out of your present equipment.

This conference, jointly sponsored by the Technical Association of the Pulp & Paper Industry, and the Technical Section — Canadian Pulp & Paper Association, will again feature formal papers, round table discussions and new ideas on the production of mechanical pulp.

For the fourth time, a broad range of topics has been selected with authorities from Canada, Germany, Italy and Sweden, among others, scheduled as speakers.



Constant research enables Norton Company to anticipate and meet the requirements of every pulp and paper mill; one of the many reasons why Norton pulpstones are the world's standard for mechanical pulp.

NORTON COMPANY, WORCESTER 6, MASS.
Norton Company of Canada Ltd., Hamilton, Ont.
Norton International Inc., Worcester 6, Mass.

NORTON PULPSTONES — *the world's standard for mechanical pulp*

Making better products . . . to make your products better

NORTON PRODUCTS: Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electro-Chemicals — BEHR-MANNING DIVISION: Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

This is AMERICAN OIL COMPANY

Our organization has more than 70 years' experience in the oil business. We are one of the largest petroleum organizations in America.

We believe the experienced American Oil representative who calls on you, plus the products and facilities which he has at his disposal, are reasons why you will like to do business with us.

Your American Oil representative receives special training for his job at our Sales Engineering School. He is given concentrated basic instruction in all phases of petroleum product quality and application. According to a planned schedule, he returns for an advanced course and then again for post-graduate work.

In our Marketing Technical Service Department are specialists who are recognized authorities in their fields. These senior consultants may be called in to work with you on any specialized problem.

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AMERICAN OIL COMPANY

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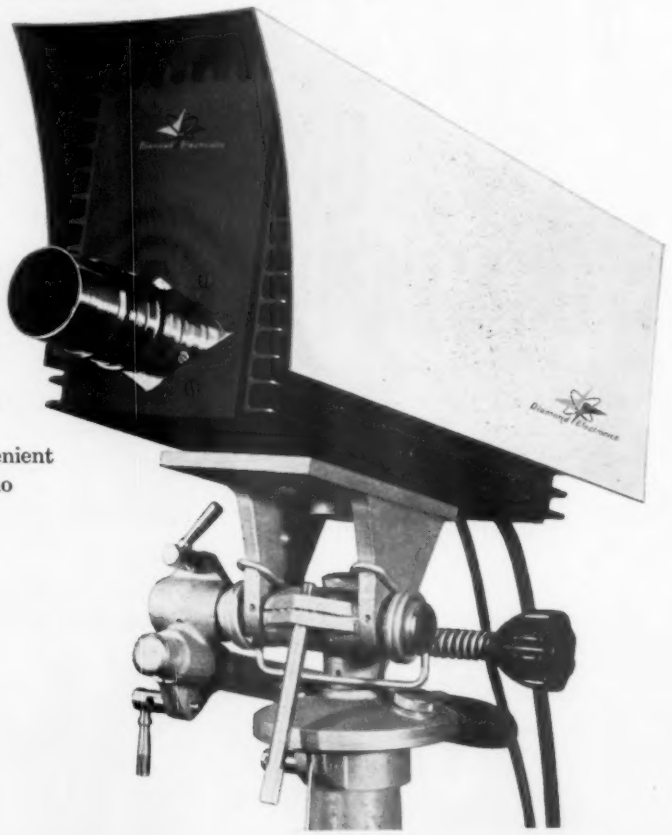
Impressed by the potential value of closed circuit television but *depressed* by reports of high initial cost, expensive maintenance, constant requirement for difficult adjustments, and general unreliability? Then listen . . . to an unprecedented proposition from the world's oldest manufacturer of industrial closed circuit television: Indoor or outdoors, in any kind of weather with practically any degree of illumination, Diamond Electronics' all new Hawk 401 Utiliscope is *guaranteed on a money-back basis* to provide a sharp, clear picture of just about anything . . . perimeter barriers, gates, transfer points, loading docks, construction areas, vehicular movement, rooftops, hazardous areas . . . all from one safe, comfortable and convenient location. The Hawk requires no special housing, no special power supply, no special adjustments for changing light and weather conditions. Just plug it into an ordinary 110 V outlet and forget about it.



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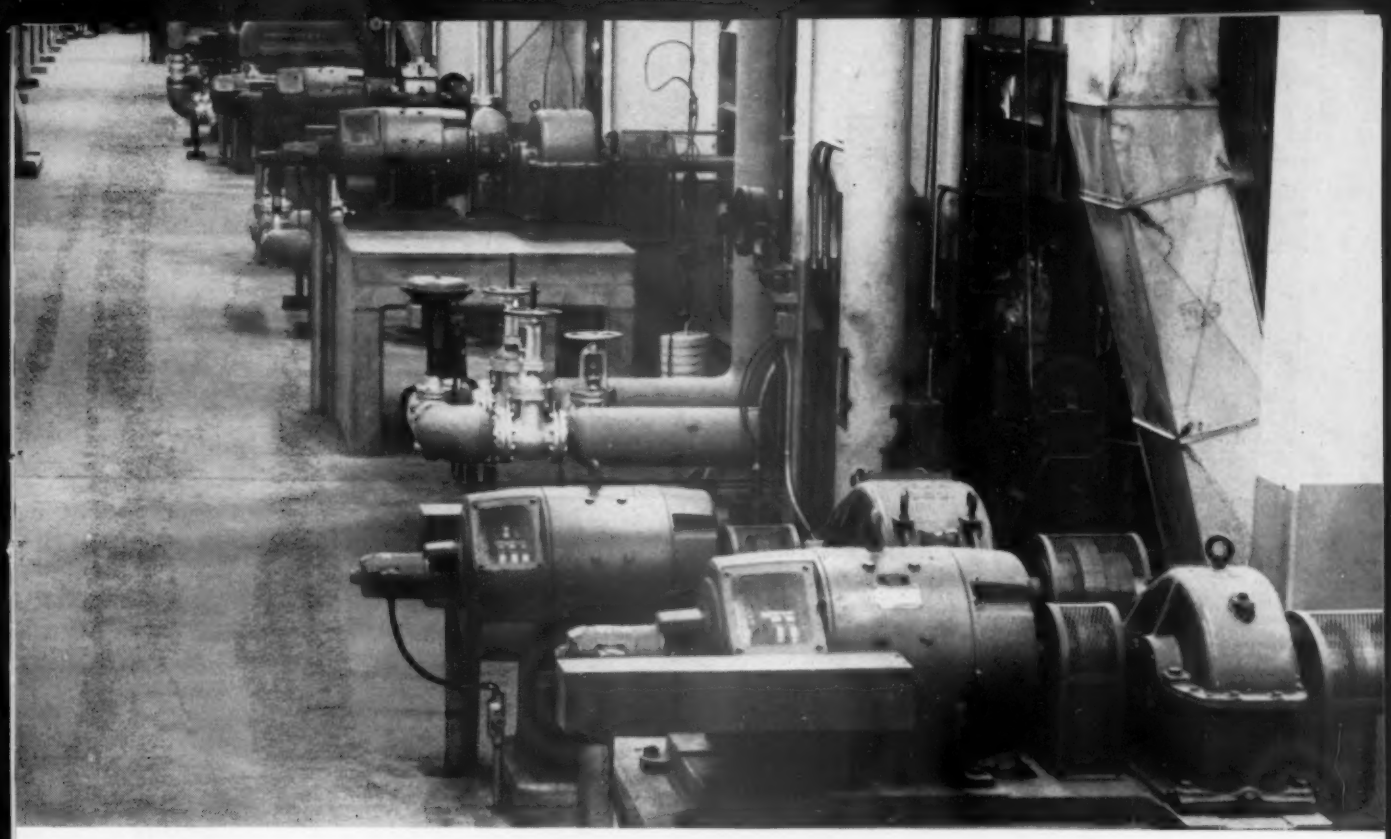

HOW WESTERN GEAR SERVES THE PAPER INDUSTRY

PULP MILL DOUBLES PRODUCTION... CHOOSES WESTERN GEAR REDUCERS AGAIN

Tooling up for doubled production, the Georgia-Pacific Paper Company's mill at Toledo, Oregon, is now using **25 Western Gear SpeedMaster* reducers** in the number-two paper machine and attendant facilities at its newly expanded 600-ton per day Kraft mill. Georgia-Pacific Paper Company is part of one of the largest and most progressive forest products companies in the nation. SpeedMaster reducers were again specified for this modern two-machine mill to insure the fastest, most efficient mill operation possible. Eleven SpeedMaster reducers power the various sections of the paper machine, from the wet end to the reel. These include couch drive, wire turning roll drive, first press, second press, first dryer, breaker stack, bottom roll, second dryer, size press stationary roll, third dryer, calendar and reel. More Western Gear SpeedMaster reducers are in use in Pacific Northwest lumber and pulp mills than any other brand. A reputation of quality since 1888 has made them the standard drive of the industry. Give your mill the benefit of Western Gear leadership. For full information, write, wire or phone: **Western Gear Corporation,** Industrial Products Division, P.O. Box 126, Belmont, California. LYtel 3-7611.

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on the long run... **QUALITY COSTS YOU LESS!**

WG INDUSTRIAL PRODUCTS DIVISION

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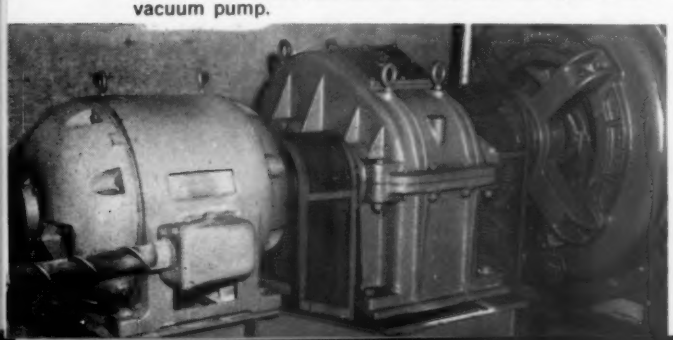
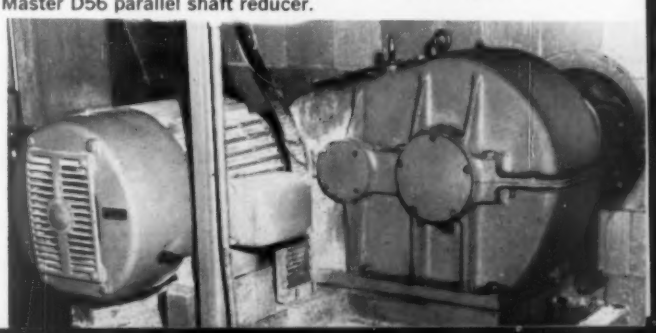
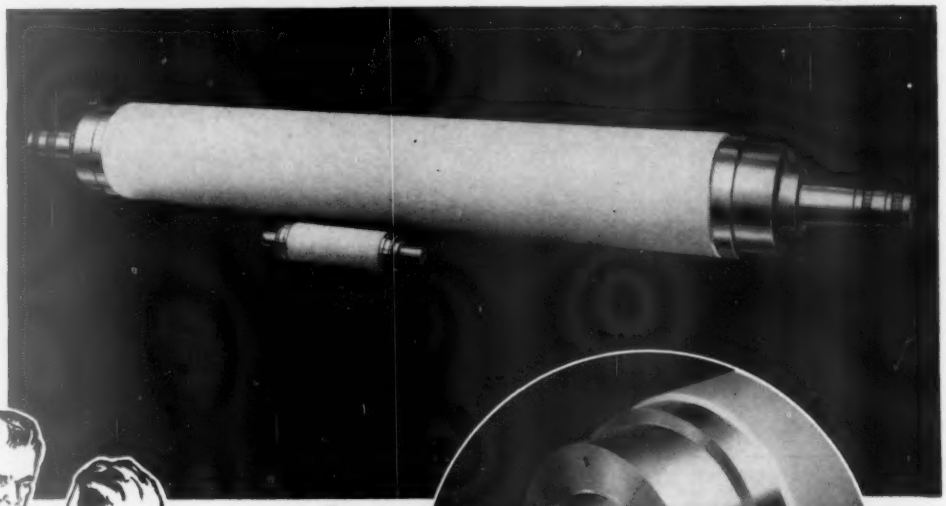
SpeedMaster S63 parallel shaft reducer driving flat box vacuum pump.



Couch pit agitator driven through a Western Gear SpeedMaster D56 parallel shaft reducer.



HERE IS PERKINS' *Answer...*



Rolls for modern supercalenders . . . journals tapered for roller bearings. Each roll end is threaded for an adaptor to facilitate roll handling.

This outstanding Perkins development is furnished in either tapered lock-up or threaded lock-up construction.

Roll shown is finished to 24" diameter by 175" face. New Perkins equipment makes possible rolls of 30" diameter and up to 200" face.

Bigger and better calender rolls made in the largest roll shop in the world.

B. F. PERKINS & SON, INC.

HOLYOKE, MASSACHUSETTS

Southern Sales Offices • Hayes Textiles, Inc., Union Street, Spartanburg, S. C. (P. O. Box 2135)

Everett C. Reed, executive of Albany Felt Company, holds synthetic fibers against a background of varied styles of chemically treated, synthetic-content, paper machine felts.

How much is enough?

Knowing the *right* proportion of synthetic fiber to wool, for example, cannot be guesswork.

When you ask us to design and manufacture a felt, these questions must be answered and answered correctly: What do you want from a felt? What performance do you seek?

As a result of long experience in selecting and blending synthetics and wools, and after thorough study of results with thousands of synthetic-content felts in actual performances . . . Albany Felt, the pioneer in developing synthetic-content felts (we hold the original patent) can assure you of the highest skill in designing and building felts to fill your specific needs.

This means improved felt performance on your machine.

Today over 60% of our felts contain synthetic fibers . . . and we are the world's largest manufacturer of paper machine felts.

ALBANY FELT COMPANY
ALBANY, N.Y.
AF
Dedicated to Paper Industry Progress

N. Monmouth, Maine Hoosick Falls, N. Y. St. Stephen, S. C.
Cowansville, Quebec Cuautitlan, Mexico

TALK SYNTHETICS WITH YOUR ALBANY FELT SALES ENGINEER ▶

The *facts* about SYNTHETIC-CONTENT *felts*

The most satisfactory synthetic fibers used in felts are Nylon and Dacron. The proper synthetic, carefully blended in the right amounts with the right wools and in the proper felt design, results in a felt that gives longer life and improved performance.

Albany Felt Company's long experience in synthetic-content felt manufacture has proved these facts:

✔ The percentage of synthetic fiber used in a specific type of felt varies with the individual paper or paperboard application involved. (Generally, the proportion is from 10% to 45%.)

✔ The amount of synthetic fiber recommended rises in proportion to the extent of punishment which the felt must endure.

✔ The percentage of synthetic fiber in a felt is not the sole answer to better-performing felts—the careful selection and blending of synthetics and wool, plus the right felt design are also most important.

✔ The careful and knowing selection of the proper chemical treatment, in conjunction with synthetics, often assures longer felt life, improved finish and performance.

MOST IMPORTANT FACT OF ALL . . .

When the "rights" are added together—the *right* design, the *right* fibers, and the *right* blending—the felt will be *right* for your requirements.

TALK SYNTHETICS WITH YOUR ALBANY FELT SALES ENGINEER

ALBANY FELT COMPANY
ALBANY, N.Y.

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Dedicated to Paper Industry Progress

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Cowansville, Quebec Cuautitlan, Mexico

NORTH AMERICA

UNITED STATES

Overall outlook for the economy and the industry is moderately good. Competition still dominates the scene. Overcapacity worries many mills; so, too, do unsatisfactory profits. Stepped up research results in many new products. Exports continue to brighten the picture. Most grades expect to see a moderate increase for 1961.

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CANADA

Despite general business leveling off, pulp-paper continues active. Mill operating rates for 1960 were at record highs. Although they may not be topped in 1961, the industry has confidence in general business conditions. Because of dependence on exports, there is grave concern about overseas trading blocs.

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THREADING a supercalender in northeastern U.S.A. specialty mill.

NORTH AMERICA

United States

Competition dominates 1961 trends. But 1962 should see further rises. Exports are important for mills.

By MAURICE R. CASTAGNE, Associate Editor

Population: 182,500,000. Per capita paper and paperboard consumption: 431.6 lbs. Paper and board mills: 812; pulp mills: 451

PRODUCTION (short tons)	1959	1960
Paper and paperboard	34,051,000	34,282,000
Total woodpulp	24,257,000	25,188,000
Chemical paper grades	16,707,000	17,515,000
Dissolving	1,092,000	1,098,000
Mechanical	3,187,000	3,247,000
Semi-chemical	1,265,000	1,970,000

Principal paper grades made: Containerboard, book paper, coarse paper. All grades are made.

IMPORTS-EXPORTS (short tons)	1959	1960
Paper imports	5,558,516	5,668,504
Paper exports	792,633	901,846
Pulp imports	2,441,721	2,389,482
Pulp exports	652,529	1,141,929

Principal paper imports from: Canada
Principal pulp imports from: Canada, Sweden, Finland
Principal paper exports to: Canada
Principal pulp exports to: Britain, France, West Germany

—New York

COMPETITION, fierce, keen and unrelenting, continues to dominate the $12 billion pulp, paper and paperboard industry as it swings into the second and possibly better half of 1961. From all indications, the U.S. economy and the paper industry are heading for a moderately good but not a boom year and 1962 should be better.

Competition has been such a major factor in the industry's actions that some have described this decade "the Competitive Sixties." From within and from outside the industry, competition is making itself felt.

Many forces are exerting their influence on the industry today: Unused capacity or overcapacity, prices, profits, mergers, long-range demand studies, plastics, new machines and mills, growth grades, exports, and some problems and, as always with a new administration in Washington, new legislative problems such as water and air pollution and the plans to reserve national wilderness areas perpetually, cutting them from all future commercial use.

Overall Outlook is Good

The economic upward trend is expected to continue for the balance of this year—but at a moderate pace. No signs of weakness in the economy for the next three to six months are seen by those interviewed by this publication. There are some who say there may be a strong upward climb for another year,

Despite expectations of a favorable upturn, however, the tremendous amount of new capacity (pulp by 1,137,078 tons, paper by 614,000 tons and paperboard by 1,002,000 tons) is disturbing under present market conditions.

This increase in productive capacity

United States Paper and Paperboard Industry

Year	Domestic Production	Imports	Exports	Total Supply	Population In Thousands	Apparent Per Capita Consumption In Lbs.	Domestic Production Requirements For 450 Lbs. Per Capita	500 Lbs. Per Capita	Industry Capacity Historic Basis
1925	9,001,742	1,567,121	152,351	10,416,512	115,800	180	——	——	11,623,450
1939	13,509,642	2,687,494	248,569	15,948,567	130,900	244	——	——	16,557,410
1946	19,277,667	3,625,982	393,250	22,510,399	141,200	319	——	——	20,420,000
1950	24,375,468	5,008,222	371,546	29,012,144	151,700	382	——	——	26,100,000
1955	30,178,102	5,386,174	845,233	34,719,043	165,300	420	——	——	30,900,000
1956	31,441,192	5,836,030	786,212	36,491,010	168,200	434	——	——	32,600,000
1957	30,666,469	5,465,706	869,716	35,262,459	171,200	412	——	——	34,300,000
1958	30,842,939	5,141,506	835,347	35,149,098	174,100	404	——	——	36,100,000
1959	34,007,068	5,561,734	919,468	38,649,334	177,100	436	——	——	37,500,000
Pre. 1960	34,282,000	5,573,045	1,020,572	38,834,473	180,500	430	——	——	38,800,000
Est. 1961	35,000,000	——	——	39,600,000	183,400	432	——	——	40,500,000
1962					186,500	—	37,400,000	——	41,600,000
1963					189,500	—	38,000,000	——	42,100,000
1965					195,700	—	39,400,000	44,300,000	——
1970					208 to 214,000	—	42,900,000	48,100,000	——
1975					225 to 235,000	—	47,100,000	52,900,000	——
1980					245 to 260,000	—	52,200,000	58,500,000	——

Source: Writing Paper Manufacturers Assn.

is expected to outstrip demand. The industry's annual growth rate in capacity has been 4%. Demand has been less. "Unless we have a tremendous upsurge in demand," says one spokesman, "there will continue to be pressure on the cost side."

Encouraging signs in the nation's economy are that personal income is still moving along—to an all-time high in May of $413.7 billion. The Federal Reserve Board's index of production moved up in May from 105 to 108, only three points off the peak reached in January, 1960. One observer says it will reach 111 by October. Housing starts, which are increasing again, augur well for such grades as building and construction papers and boards.

Grade-by-Grade Round-Up

Overall paper and paperboard production for the first half of 1961 was about 17.3 million tons, down less than 2% from the same time last year, which was 17.541 million tons. If the moderate upturn develops into a strong one, as some say it may, the industry will produce more than 34 million tons.

Fine paper industry was about 4-5% ahead of last year for the first six months of 1961. Shipments increased about 5%. The second half should be better. But some say that a 6-7% yearly increase is not enough to take up new capacity of about 12%. For instance, about six fine paper machines are scheduled to start up this year.

Printing papers are 2% off from 1960. Uncoated groundwood is up, and surprisingly coated book is down. This is because advertising lineage has been off in periodicals. The industry, however, expects to come out fairly close to last year—perhaps 1-2% better.

Tissue papers continued its average growth of 4.5% when the rest of the paper industry fell. Right now, however, tissue is below the long term trend line. From all indications, the tissue market is in reasonably good shape and should finish the balance of the year in line with its long term trend—or possibly higher.

In tissue, there has been a definite trend toward higher quality in facial tissues. Facial continues to grow at a faster rate than single ply. Household rolls have had a fast growth in the past year. Encouraging signs: Converted product shipments, which are a significant factor because primary production can go into inventory, are ahead of last year by a few percentage points.

Paperboard was ahead .5% at midyear. In March it had been 4% behind but picked everything up and is now ahead. Most important is that orders are well up; first starting with a 2½% increase in April, then 3.5% in May and about 5% in June.

Also important in paperboard's picture is that for the week of June 24 the industry produced 336,900 tons, tying for second place as the second highest week in the industry's history. Still tops: 338,100 tons for the third week in Sept. 1959.

By fall, paperboard should be functioning as it did in the beginning of 1960 when it had tremendous pressure put on it to turn out board. That was when the FRB index shot to 111. Paperboard is now operating at 91% capacity.

A sudden change in the boxboard picture took place at midyear. It moved 4-5% ahead of last year—the highest production in its history.

The world board market is good. For the first four months, exports were up 25%. Not much tonnage is concerned—about 180,000 tons, but it takes that much from unused capacity. Says one observer, "The seasonal low of about 86% usually comes in July; and then perks up to about 108% in October."

Kraft papers are running a little better than 85% capacity. Last year, they operated at about 95%. The industry expects to wind up 1961 pretty close to 1960. It had a poor first six months, but expects the second half to be better. Production in 1960 was about 2,860,000 tons. A 1-2% increase to 2,876,000 tons is expected.

Specialty papers were down about 5% in volume at midyear. The outlook is for the usual summer slump and then a fall pickup. Overall the outlook is for slightly less production, about 2-5%, than 1960.

Polyethylene coated papers and paperboard were about the same level at mid-year as in 1960. The trend this year is to more polyethylene coating of paper than paperboard. Total plastics consumption on paper and board is up 10-15%. Plastic coated papers should be up about the same and should end up 1961 better than 1960.

Paper stock was down at midyear, substantially below 1960. Yearend output is expected to be substantially down, below the 25.3 million tons of 1960. "When mills get more cost conscious," says one spokesman, "paper stock may come back."

Emphasis on Research

Pushed on all sides by competition the paper industry is emphasizing more research.

One company, opening its $4.5 million research center, explains, "Today the measure of a company is recorded not only on its profit and loss statements, but also in its research program . . . paper has been comparatively slow to do research . . . (because) it has been less affected by obsolescence than most other industries . . . this is changing . . . research is one tool to overcome overcapacity."

Today's scientists are working on papers made of glass, ceramics, nylon, acrylic fibers, Teflon, aluminum, steel, copper, zinc, silver, lead and polystyrene—and of course, cellulose fibers. One company is thinking that any material that can be transformed into the right size fiber can be made into paper. And for an industry worried about prices—and paper definitely is—here is comforting news: Some of the so-called exotic papers sell for about $420 per lb.

Market research is of greater interest. Speaking on the results of such research, an experienced industry observer said, "Some new paper products still sound a little fanciful, but not any more so than was the idea of using hardwood pulps to produce high grade printing and writing papers a few years ago."

Some of these new ideas: (1) Paper with glass fibers mixed with cellulose pulp for greater dimensional stability, non-curl and strength. (2) Disposable paper clothes for laboratory aprons and coats, hospital pillow cases and sheets, work uniforms. (3) Knitted papers. (4) Extensible papers. (5) Paper blankets. (6) Silky ceramic paper so resistant to heat it can be used to line a trough for molding molten metal. (7) Paper forms for pouring concrete foundations for bridges, buildings and dams. (8) Wood fibers and textile fibers blended

"Big 12" American Companies In Pulp and Paper Industry

	Sales In Thousands of Dollars
International Paper Co.	$1,012,648
Crown Zellerbach Corp.	$553,711
St. Regis Paper Co.	$536,199
Weyerhaeuser Co.	$457,916
Kimberly-Clark Corp.	$409,256
Container Corp. of America	$327,263
Scott Paper Co.	$313,276
West Virginia Pulp and Paper Co.	$250,282
Diamond National Corp.	$236,654
Georgia-Pacific Corp.	$221,998
Union Bag-Camp Paper Corp.	$212,959
Champion Paper & Fibre Co.	$204,010

Note: Sales for some of above firms also include lumber, plywood and other forest products as well as pulp and paper.

All reports for year ending Dec. 31, 1960, except fiscal years for Kimberly-Clark, West Virginia and Champion ended at different dates in 1960.

to produce entirely new materials. (9) Plastic extrusion coated paper and board containers for edible and non-edible liquids.

Plastics competition strengthens paper. This observer said, "Plastics have fortified the products of our industry in many markets to a greater extent than they have taken markets away. . . Estimated industry losses to plastics range from about 400,000 tons, while some 500,000 tons were used by the plastics industry.

"At that rate of exchange" says the president of one of the largest paper companies, "we don't have much to worry about."

The industry spends about $64 million a year in research, expects to up this to about $100 million by 1964-65. It is still far behind some other major industries in research investment.

It has often been predicted that some day the paper industry would be a chemical industry. Probably never has the industry been so close to such a position as it is today. Almost each day brings reports on new by-products. Some companies have set up separate chemical marketing organizations. By-product chemical sales from one company top the $10 million mark. In a recent move, a West Coast paper company has joined with a giant chemical company to study chemical by-product possibilities.

One company president says, "Some day this mill will produce pulp as a by-product to get it out of the way of more valuable products."

Exciting New Products

The new products race has uncovered two exciting developments: Polyethylene coating of milk containers—from pint, quart, half-gallon and soon in the gallon size. This is a major trend and athough there is a substantial price differential between wax (10¢/lb.) and polyethylene (30¢/lb.), the nation's dairies are shifting to the polyethylene.

The second new product development is an aluminum-paperboard can that promises to open new fields in the citrus industry. The aluminum-paperboard container has an easy opening, tear-off aluminum top. The body is paperboard, lined with aluminum foil. A tab is attached to the ends of the can by a patented cold welding process. The tab is easily removed by inserting the tip of the fingernail under the tab and unwinding the scored top. Estimates of the amount of paperboard which would be used: 10,000 tons for citrus products alone. The container is also adaptable to dry and wet products but could not be used for pressure or retorted products because of the cemented side seams. Considerable tonnage would be involved if the can were used to package oil; possibly upwards of 50,000 tons of board would be used.

There have been several developments within the past year on coated bleached foodboard and other board grades. One mill, using a relatively new type coater, is producing what some experts say is probably the lowest cost coated bleached board on the market.

The Capacity Problem

Unused capacity, or overcapacity as it is more commonly called, is behind many of the industry's troubles. Encouraged by economic upswings in the past few years and perhaps by too optimistic economic demand forecasts, the industry began to lay plans for what it considered good, sound, healthy growth.

Unfortunately, it now finds itself with considerable unused capacity on hand. Faced with higher costs of operations, labor, raw materials and transportation, the industry has been forced to price cutting.

Twenty-two new paper and paperboard machines are scheduled for installation this year. Plans for these machines were made when the nation's economy was on the rise and when the industry was operating at close to 95% capacity. Three of these new machines will be for printing papers, four for fine papers, two for printing and fine combined, one for printing, fine and bleached specialties, one for newsprint, one facial and toilet tissues, two for kraft papers, one for bleached board, four for board, two for 9 pt. and one for manila-lined board.

At this time, eight more machines are slated for installation in 1962 and later. One machine will be for printing, one for fine, one for fine, printing and unbleached specialties, two newsprint machines, one specialty paper and board and two for paperboard.

Some industry leaders are chafing from the much repeated question: "If the steel industry can operate at

United States New Machines

Installed in 1960

Grade For Which Intended	Machine Manufacturer's Rated 24-Hour Capacity (In Tons)
Printing	200
Printing	140*
Fine	13
Fine	53**
Printing and Fine	190
Printing and Fine	125
Printing and Fine	150**
Tissue	10***
Tissue	70
Tissue	25
Tissue	25
Towel and Lightweight Kraft	60
Glassine and Bleached Kraft Specialties	228***
Specialty Paper and Board	50
Specialty Paper and Board	24**
Kraft Paper	175
Bleached Board	340
Board	232
Board	316
Board	350
Roofing Felts	125-140

*Advanced from 1961
**Replacement
***Originally scheduled for 1959

To Be Installed in 1961

Grade For Which Intended	Machine Manufacturer's Rated 24-Hour Capacity (In Tons)
Printing	200*
Printing	125
Printing	140
Fine	12
Fine	15
Fine	60*
Fine	100
Printing and Fine	150
Printing and Fine	120
Printing, Fine and Bleached Specialties	220*
Newsprint	150
Facial and Toilet Tissue	40
Kraft Paper	125
Kraft Paper	150
Bleached Board	300
Board	165
Board	500
Board	500
Board	350
.009 Board	125
.009 Board	185
Manilla Lined Board	142

*Originally scheduled for 1960

Scheduled for Installation In 1962 and Later

Grade For Which Intended	Machine Manufacturer's Rated 24-Hour Capacity (In Tons)
Printing	225
Fine	140
Fine, Printing and Bleached Specialties	300
Newsprint	210
Newsprint	400
Specialty Paper and Board	25
Board	600
Board	250

Source: Writing Paper Mfrs. Assn., based upon their survey of paper machinery manufacturers.

60% capacity and make a profit—why can't paper?" As with all comparisons, this one is particularly odious because you can not compare two dissimilar items. The steel industry regards 75% capacity operation as normal operation. If they have to go above 75% capacity, they call it marginal capacity, operations which are not ordinarily profitable to run.

The paper industry is not geared this way. It does not have unused capacity built into its prices as some say it should. Perhaps if market conditions warrant it, the industry may be able to do this. But under present conditions when there is much overcapacity in pulp, paper and paperboard, it is not practical. Not that it has not tried. It has. But it does not work.

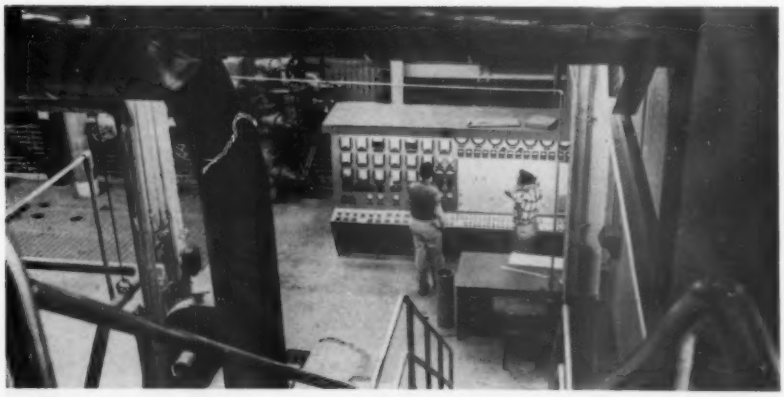
Exports Brighten Picture

One of the fortunate trends in 1960 for the U.S. industry, and so far it continues somewhat that way at midpoint in 1961, is the considerable upswing in exports. Overall exports of pulp, paper and paperboard were up about 20%. Says one American industry executive, "This is the one bright spot I can see for the paper industry. How long it will last I don't know."

"We are very much aware," one industry leader says, "of the tremendous untapped export potentials. Some mills may ask why should they worry about the export problem. My answer is they'd better start worrying now because if that million tons of pulp and million tons of paper and paperboard now being exported has to be sold or absorbed in this country, they will soon find it their problem."

Lowering of tariffs among nations comprising the European Free Trade Area has caused American paper companies to ask the U.S. government

FAST GROWING WEST COAST needs are being supplied by additions of primary and converting facilities. These two machines are at Georgia-Pacific Paper Co., Toledo, Ore.; one is about two years old, the other was added in 1960.



VERSATILE SOUTHERN MILL was put on stream by Continental Can Co. at Augusta, Ga., using continuous kraft pulping and cold soda pulping to produce variety of bleached and unbleached board grades. Paper machine features on-machine coating. Shown here is operating panel of Kamyr digester.

SOUTH'S NEWEST MILL is Tennessee River Pulp and Paper Co. at Counce, Tenn. Designed for 500 tons/day, the mill has been producing more than 650 tpd.

to assist in getting equal benefits for them.

Exports of pulp, paper, board and products from the United States increased by $82 million in 1960 to reach $419 million.

Although exports were continuing at a remarkably high level at mid-year, 1961, some leaders were cautioning against too much optimism. Some believe that once the bloom is off the export boom that the industry may finish out the year about even with 1960.

Long Range Demand Forecasts

On the whole, the history of long range forecasts of pulp, paper and paperboard demand has largely been one of underestimation. Perhaps knowing this tendency, some of the more recent forecasts may have been highly optimistic as to the industry's prospects. And in one forecast, in particular, it has been suggested that politics have played a role.

The one forecast that appears to have caused the most controversy is one issued about mid-1960 which projected future demand for paper and paperboard for the year 2000. This is the story behind this forecast. The Senate Select Committee on National Water Resources wanted information to support new federal pollution controls, asked the Dept. of Commerce's BDSA to make a forecast of paper and board demand and probable wood requirements for the year 2000. The forecast was based on a set of forecasts of the total economy made by the Ford Foundation's Resources for the Future group. BDSA came up with a demand estimate of 240 million tons of paper and paperboard for 2000.

BDSA was unhappy with this forecast and made a projection of its own and came up with a demand estimate of about 155 million tons—still considerably higher than present production of about 34 million tons. This is still seriously questioned by many industry leaders, and an important possibility is that the lignin riddle will be solved long before 2000 AD and many lignin plastics (from wood) will replace or augment paper uses.

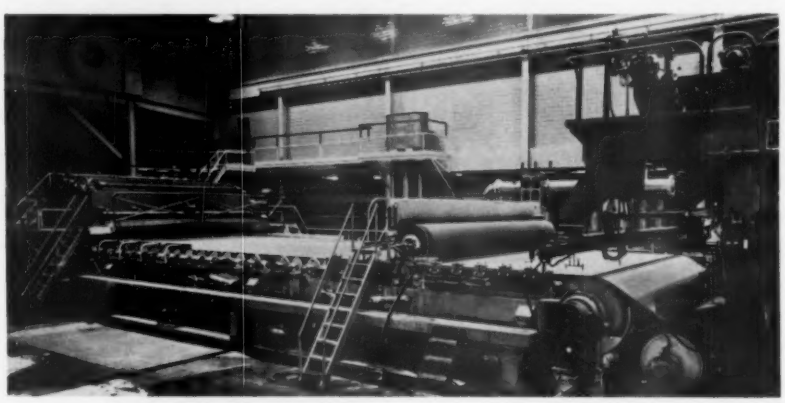
Poor Profit Picture is Familiar

Generally speaking, the industry's annual reports in 1961 spoke of higher sales but lower earnings. Explains one executive, "We are a high capital investment industry competitive with oil and chemicals as regards demand for investment capital. If money is to be available to us for normal expansion purposes at reasonable rates of interest, then we must show proper regard for the value of our stockholders' investment. We must be constantly conscious of earnings per share as an outward sign of inward growth.

"When new capacity is added, because of the very size of the units and length of lead time needed, it is practically impossible to have capacity balance out with demand and under this circumstance if we are to properly serve our customers, then we must be prepared to carry some reasonable amount of unused capacity and this unused capacity should be our very strength and not the weakness of our industry.

"The dilemma is that if the industry does not expand rapidly enough its customers will look elsewhere for its needs. If it expands too rapidly it seems to show no patience for the market to grow towards its ability to produce. Every sale then becomes an emergency."

As one industry leader puts it, "Business leadership never had a greater opportunity for service. Never was there a greater need or opportunity to persuade or dissuade—to understand not only our own individual problem but also the other fellow's . . . persuasion with a minimum of friction—energetic economic progress with maximum understanding."



IN NORTHEAST, new fine paper machine went on stream in late 1960 at Fraser Paper Ltd.'s mill in Madawaska, Maine.

ANOTHER MIDDLE WEST MILL makes the switch from straw to wood. Reasons: on one hand, use of combines, trend away from stationary threshing; greater distance from paper mills; rising farm and transport costs. On the other: new use for "weed" trees close to Midwest mills, because of semi-chemical process discoveries. This is Weston Paper & Mfg. Co., Terre Haute, Ind., with a new neutral sulfite pulp mill.

U.S. newsprint shows moderate improvement

NEW YORK—The U.S.A. newsprint picture does not look "too black," says one report. There is more newsprint production this year than at the same time last year. Consumption however is not holding up too well, although it is not too far behind (2½%) the first five months of 1960. The industry hoped for a moderate improvement as the economic situation gained in mid-1961.

Newspapers actually had a better Spring than statistics seem to show, says one paper industry analyst. He suggests that while consumption appears to show a downturn, a study of the situation shows a continuation of the business upturn that started in February. Easter advertising this year was in March, consequently April figures for newsprint consumption were low compared with March, or with April of last year when there was Easter advertising the first 16 days of the month.

If the first quarter improvement continues for the rest of the year, consumption for 1961 will approximate 1960 instead of falling off as had been expected.

Newsprint production was at a higher level in mid-1961 than a year ago but there is still unused capacity. The first five months production was 3.7% ahead of 1960, and annual production might be up about 3% over 1960. There has been a substantial improvement in the value of U.S.A. export shipments—a 98% increase in the first five months of 1961, but this was an increase of only 22,000 tons.

The Canadian newsprint industry shipments in midyear were up about 4% from a year ago.

Considerable interest is being shown in a newsprint mill soon to go into operation at Garfield, N.J. Garden State Paper Co. will make newsprint with a furnish primarily of deinked overissue newspapers. Richard B. Scudder, publisher of the Newark (N.J.) Evening News is owner of the mill. He caused a flurry of excitement in February when he was quoted as saying that he would sell newsprint at $80/ton. Mr. Scudder said he was misquoted; that he said he could make newsprint for $80/ton cost, not sell it at that price.

The accompanying table on individual mills, prepared by this magazine, reveals how much U.S. newsprint industry "fled" from the country (to Canada) back in the 1920's. In 1913, there were 65 U.S. companies making newsprint; by 1926 there were only 38; by 1946, just seven. But with the development of a kraft-based newsprint industry in the South and the use of Chemigroundwood in the North, the United States industry has been making a comeback, as the table reveals.

The flight of the industry to Canada was the direct result of the newspaper industry's influence in the United States Congress to deprive newsprint manufacturers of the tariff protection which is still accorded to other paper grades made in this country. Although, today, tariffs are much less important than they were. But this was the basis that established the strong Canadian newsprint industry, starting before World War I and in the 1920's.

Much of this has been American investment. But the mills in the United States turned to more profitable paper grades and products.

COMPANIES PRODUCING NEWSPRINT IN U.S.A.

Especially prepared by PULP & PAPER (Copyright by PULP & PAPER)

	1926	*1946*	*1956*	*1959*	*1960*	*1961*
Alexandria Paper Co. .	15,000	—	—	—	—	—
Algonquin Paper Co. .	29,000	—	—	—	—	—
Blandin Paper Co.	22,000	—	—	—	—	—
Bowaters Southern Paper Corp.	—	—	180,000	375,000	400,000	420,000
Cliff Paper Co.	13,000	—	—	—	—	—
Consolidated Water P. & Pa.	102,000	—	—	—	—	—
Coosa River Newsprint Co.	—	—	140,000	270,000	270,000	270,000
Crown Zellerbach Corp.	174,000	200,000	240,000	248,000	250,000	255,000
Cushnoc Paper Co. ..	20,000	—	—	—	—	—
De Grasse Paper Co. .	56,000	—	—	—	—	—
Dells Pulp & Paper Co.	12,000	—	—	—	—	—
Escanaba Paper Co. ..	170,000	—	—	—	—	—
Finch, Pruyn & Co. ..	44,000	10,000	—	—	—	—
Flambeau Paper Co. .	14,000	—	—	—	—	—
Gary Paper Mills, Inc.	—	—	—	—	—	—
Gilman Paper Co.	17,000	—	—	—	—	—
Gould Paper Co.	17,000	—	—	—	—	—
Grandfather Falls Co.	11,000	—	—	—	—	—
Great Northern Paper Co.	257,000	300,000	520,000	570,000	560,000	515,000
Great Western Paper Co.	20,000	—	—	—	—	—
Hennepin Paper Co. .	12,000	—	—	—	—	—
High Falls Pulp & Paper	8,000	—	—	—	—	—
Inland Empire Paper Co.	29,000	—	22,000	23,000	23,000	25,000
International Paper Co.	323,000	—	25,000†	238,000	240,000	270,000
Maine Seaboard Paper Co.	—	104,000	—	—	—	—
Manistique Pulp & Paper	20,000	—	8,000	8,000	12,000	20,000
Minn. & Ontario Paper Co.	76,000	—	—	—	—	—
Neekoosa-Edwards Paper	10,000	—	—	—	—	—
Northwest Paper Co. .	14,000	—	—	—	—	—
Oswegatchi Paper Co.	16,000	—	—	—	—	—
Oswego Falls Corp. ..	11,000	—	—	—	—	—
Pejepscot Paper Co. ..	41,000	—	35,000	10,000	7,000	2,000
Publishers Paper Co. .	9,000	56,000	100,000	125,000	125,000	130,000
St. Croix Paper Co. ..	55,000	75,000	100,000	150,000	150,000	150,000
St. George Paper Co. .	10,000	—	—	—	—	—
St. Lawrence Paper Co.*	—	—	25,000	14,000	—	—
St. Regis Paper Co. ..	115,000	—	—	—	—	—
Sherman Paper Co. ..	16,000	—	—	—	—	—
Southland Paper Mills	—	55,000	175,000	290,000	290,000	240,000
Tidewater Paper Mills	32,000	—	—	—	—	—
Watab Paper Co.	17,000	—	—	—	—	—
Waterway Paper Prod. Co.	14,000	—	—	—	—	—
West End Paper Co. .	13,000	—	—	—	—	—
West Tacoma Newsprint Co.	—	—	60,000	68,000	68,000	70,000
Wisconsin River Paper & Pulp	25,000	—				
TOTAL	1,739,000	820,000	1,630,000	2,389,000	2,395,000	2,367,000

**Former St. Regis mill at Norfolk, N. Y.*
†Mobile, Ala.

How States Rank . . . 1959

Washington in pulp and Wisconsin in paper production retain their No. 1 positions

HOW STATES RANK IN PULP PRODUCTION
(in short tons for latest available years)

	1957	1958	1959
1. Washington*	2,793,383	2,592,347	2,804,823
2. Georgia	2,192,108	2,138,848	2,420,556
3. Florida	2,137,016	2,102,162	2,373,800
4. Maine	1,561,152	1,409,854	1,520,380
5. Louisiana	1,525,832	1,434,254	1,516,168
6. Alabama	1,450,906	1,127,630	1,312,997
7. North Carolina	1,111,493	1,113,349	1,243,649
8. Wisconsin	1,190,697	1,180,726	1,228,752
9. Virginia	1,013,976	1,095,275	1,165,005
10. Oregon	896,698	970,045	1,023,136
11. Texas	578,933	568,303	624,433
12. New York	537,852	516,524	520,934
13. Michigan	301,746	390,234	492,723
14. Pennsylvania	410,383	410,411	426,251
15. Ohio	203,012	120,190	149,462
16. New Jersey	78,154	83,082	72,912
TOTALS (for all states	21,800,209	21,795,652	23,383,391

* Includes Alaska

STATES RANK IN PAPER/BOARD PRODUCTION
(in short tons for latest available years)

	1957	1958	1959
1. Wisconsin	2,043,374	2,061,756	2,181,752
2. Florida	1,828,920	1,817,594	1,955,561
3. New York	1,784,568	1,795,111	1,892,553
4. Georgia	1,825,028	1,749,739	1,784,945
5. Michigan	1,605,228	1,657,950	1,780,712
6. Louisiana	1,725,791	1,671,441	1,776,744
7. Pennsylvania	1,615,048	1,599,184	1,750,737
8. Ohio	1,486,863	1,480,938	1,713,224
9. Maine	1,703,674	1,608,794	1,691,456
10. Washington	1,540,525	1,476,080	1,577,809
11. Virginia	1,143,818	1,113,708	1,278,081
12. California	1,023,654	1,090,312	1,254,544
13. Alabama	856,059	955,073	1,185,416
14. South Carolina	904,763	938,533	1,141,613
15. New Jersey	1,115,739	1,123,568	1,112,870
16. North Carolina	853,576	834,860	1,065,885
17. Minnesota	824,905	830,530	939,774
18. Illinois	845,322	835,533	892,812
19. Massachusetts	734,010	760,092	772,607
20. Mississippi	708,682	687,208	741,832
21. Texas	636,498	656,854	739,176
22. Tennessee	670,343	643,913	729,156
23. Connecticut	311,945	308,796	360,929
24. Indiana	308,708	282,657	348,175
25. New Hampshire	308,370	298,674	343,359
26. Maryland	299,485	301,382	327,833
TOTALS (for all states)	31,428,155	30,774,800	34,007,068

THE U.S.A. BY REGIONS

Competition pushes West into converting

Captive processing of pulp-paper-paperboard into user-type products has increased extensively on the West Coast, especially by kraft manufacturers. Practically all have built, acquired, or announced intentions of building, converting operations.

This secondary processing requires additional effort, time and money per ton of prime product while yet in proprietorship of the basic producer. Behind the movement lies management's aim to sustain business by keeping products, markets and processing competitive. Among the diverse influences contributing to this industrial metamorphosis, in a region once noted for its market pulp production, are population increases, transportation costs, improved marketing through better packaging, loss of real

PACIFIC COAST STATES
ANNUAL WOODPULP CAPACITY
(in short tons)

1934	1,296,265
1939	1,659,430
1946	2,057,974
1949	2,578,964
1952	3,302,501
1955	4,152,828
1956	4,537,718
1957	4,857,684
1958	5,068,049
1959	5,157,332
1960	5,584,456
1961	5,931,341
1962	6,226,050

Source: U.S. Pulp Producers Assn., Inc.

U.S. PACIFIC COAST—PULPWOOD
Receipts—Consumption—Inventories
(In Thousands of Cords)

Yr.	Receipts: Domestic	Receipts: Imports	Receipts: Total	Consum.	Yr. End Invent.
1941	2,585	332	2,918	3,019	742
1945	2,470	126	2,596	2,472	420
1949	3,015	148	3,162	3,199	1,031
1950	3,244	287	3,531	3,822	772
1951	4,565	261	4,826	4,490	1,070
1952	4,339	155	4,494	4,499	1,133
1953	4,463	—	4,463	4,692	1,108
1954	4,924	—	4,924	5,425	959
1955*	5,967	531	6,498	6,484	1,166
1956*	7,355	497	7,852	7,201	1,808
1957*	7,175	436	7,611	7,287	1,922
1958	6,312	338	6,651	7,033	1,464
1959	(combined)		7,623	7,636	1,257
1960			8,605	8,222	1,771

Source: APPA from Bureau of the Census
*Includes Alaska

or potential markets as result of mergers, and—most important—overproduction of kraft.

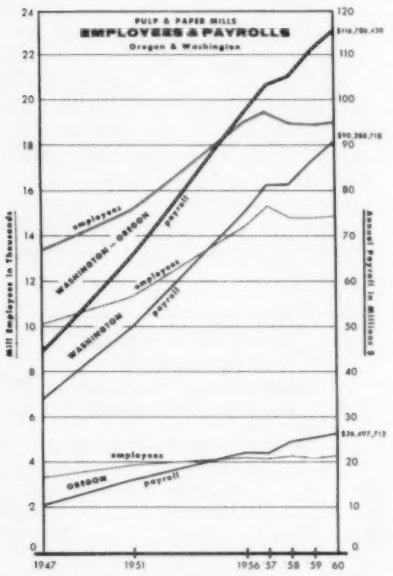
As a result of this integration, sales competition has shifted from prime mill level to captive plants. Except for the manufacture of some specialties in limited quantities, the growth prospects for independent converting plants consequently are becoming increasingly limited.

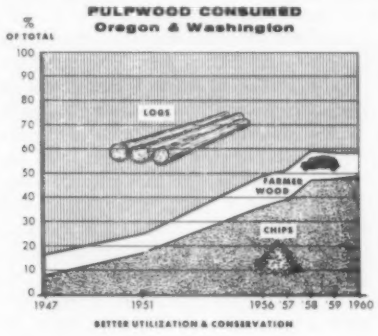
The West Coast industry continues to lessen its dependence on main wood species and round logs, to extend the line and volume of by-products manufactured from conventional pulp residues. There is wide interest in the prospects of manufacturing groundwood type pulps from chips and sawdust-shavings mixtures. Each is represented by at least one recent "guinea pig" installation in the Pacific Northwest.

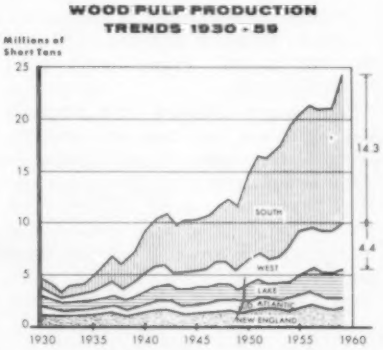
With exceedingly few exceptions pulp-paper plants on the West Coast are doing a fine pollution-prevention job. In almost every instance mills are beyond reproach so far as their air and water effluents are concerned—a better status than has been achieved by many municipalities and other industrial operations. Progress over and above minimum legal qualifications continues to be made. These projects stem from both "economic" and "good citizen" motives.

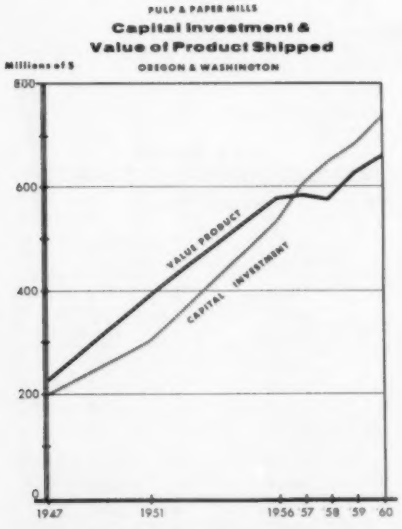
As a whole, practically everything went up in 1960 except net earnings and per-unit product prices. Both of these were down generally. A survey made by Northwest Pulp & Paper Assn., Tacoma, Wash., discloses that Washington and Oregon mills continued to grow and expand in 10 economic categories last year. This is graphically depicted in the NPPA charts reproduced here.

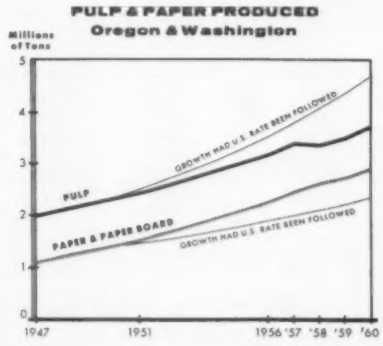
Regarding California operations, where pertinent industrial information has not been compiled on the comprehensive basis as was done by NPPA, what data are available indicate a similar upward trend of the industry in that state. Data relating to aspects of employment "in paper and allied products" display a rapid growth in 1959, which continued in 1960 at a somewhat reduced rate.



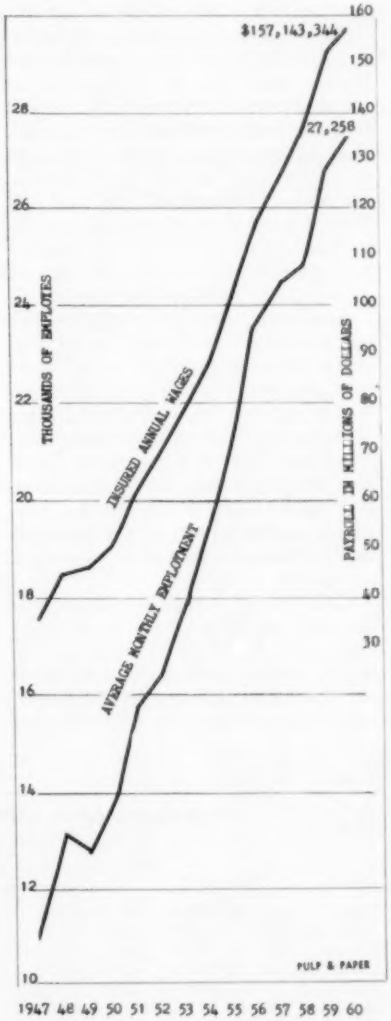








MILLS IN OREGON AND WASHINGTON are growing, as indicated by these graphic reports prepared by Northwest Pulp & Paper Assn.


$157,143,344
27,258
THOUSANDS OF EMPLOYEES
PAYROLL IN MILLIONS OF DOLLARS
DESIRED ANNUAL WAGES
AVERAGE MONTHLY EMPLOYMENT
PULP & PAPER
1947 48 49 50 51 52 53 54 55 56 57 58 59 60

CALIFORNIA average monthly employment and payrolls for paper and allied products, compiled from State of California Dept. of Employment statistics. 1960 figures based on 9 mos. period. Number of units (reporting quarterly) increased by 63%, from 226 in 1947 to 366 in 1960.

Midwest mills thrive on specialties

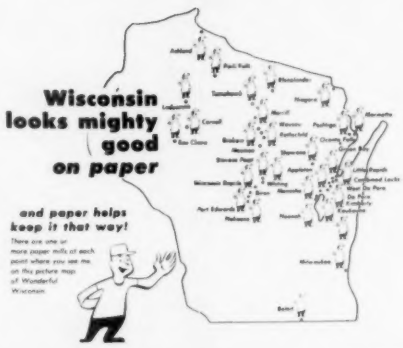
The Middle West and the Lake States pulp and paper mills, while feeling the pinchback of the recession to some extent in late 1960 and early 1961, was generally more productive and more active than those farther east.

Wisconsin maintained its No. 1 spot in papermaking in the U.S.A., while Michigan went ahead of Louisiana, taking over No. 5 spot (see latest official 1959 table on state rankings). Ohio climbed, too, from 9th to 8th rank, going ahead of Pennsylvania. Illinois, Minnesota and Indiana were in the top 24 states, the latter two gaining, while Illinois slid off a little.

Semi-chemical pulping continues as a major Midwest trend with Weston Paper Mfg. Co. of Indiana being latest of several Midwest mills to shift from straw to wood for raw material. Forest industries in Michigan own 8% of commercial forests; in Wisconsin, 6% and in Minnesota, 3%, but are buying a major part of needs. In important areas, semi-chemical pulping has settled down wood demand and growth to a comfortable balance.

Significant signs of growth—in Wisconsin alone, seven new paper machines recently installed or ordered—for Consolidated at Whiting, Kimberly-Clark at Niagara, Nekoosa-Edwards at Nekoosa, Wausau Mills at Brokaw, Nicolet at DePere, Charmin at Green Bay. In this WORLD REVIEW, we present more facts of interest on Wisconsin—as the leader of the Midwest paper states—making 10% of U.S.A. production.

Culminating an uphill climb out of the near disastrous days of 50 years ago, when the lifting of Canadian tariffs on newsprint threatened to knock out the paper industry in Wisconsin, state manufacturers burst all sales and production figures—relying largely on specialty and consumer products.



WISCONSIN PAPER FACTS

	1950	*1960*
Employes	22,250	39,300
Payrolls	$112,172,200	$242,606,700
Tonnage	1,750,000	3,350,000
Investment	$495,300,000	$997,634,000
Value of Products shipped	$649,417,000	$951,725,000
Taxes Paid	$88,864,000	$145,323,000

PAPER, WISCONSIN'S NO. 1 INDUSTRY, shipped 3,350,000 tons of products valued at $951,725,000 last year. Significant facts of this kind are disseminated regularly by the state's Paper Industry Information Service.

The decade of the Fifties was a particularly outstanding period—with Wisconsin paper employment and production increasing by about 50%. A recent report noted that annual production of pulp, paper and paperboard in Wisconsin amounted to about 3 1/3 million tons. Ten years ago annual output was about 1,750,000 tons.

In addition to tonnage, Wisconsin mills leads all other states in value of products shipped (approximately $950,000,000 annually), in taxes paid ($145,000,000 yearly), in capital investment (almost a billion dollars), and in annual wages (more than $240,000,000).

The paper industry now employs approximately 39,500 persons throughout the state—about 9% of Wisconsin's manufacturing payroll. Ten years ago the figure was about 23,000. The weekly earnings of mill workers has almost doubled in the decade: from an average of $55 in 1950 to more than $100 in 1959—plus an estimated $20 to $25 per week per employe in various fringe benefits.

The industry uses about $15,000,000 worth of Wisconsin pulpwood annually—about half the total it consumes. There are an estimated 10,000 full- and part-time pulpwood producers in the state. And Wisconsin paper firms spend about $10,000,000 yearly for trucking and railroading services.

Record of Wisconsin Paper Group 35 Wisconsin Companies Pool Car Shipments

(Selected comparative years)

	No. of Pool Cars Shipped	*No. of Tons Shipped*
1935	1,880	43,244
1940	2,714	68,367
1950	2,840	75,189
1955	3,025	78,859
1956	3,174	78,654
1957	3,130	80,682
1958	3,299	86,630
1959	3,348	88,703
1960	3,418	89,186

MIDWEST PAPER AND BOARD PRODUCTION

(Thousands of Tons)

Year	*Total U.S.*	*Wisconsin, Michigan & Minnesota*	*Wisconsin*	*Michigan*	*Minnesota*
1929	11,140	2,296	886	1,092	318
1938	11,381	2,141	882	1,012	247
1941	17,762	3,208	1,264	1,476	468
1948	21,897	3,594	1,463	1,468	663
1956	31,441	4,612	2,063	1,704	845
1958	30,775	4,551	2,062	1,658	831
% Increase					
1956 1929	182%	101%	133%	56%	166%
1958 1938	170	113	134	64	236
1956 1941	77	44	63	15	81

Source: The Statistics of Paper—1960 (APPA), Based on Bureau of the Census reports.

LAKE STATES ANNUAL WOODPULP CAPACITY

(in short tons)

1934	1,363,535
1939	1,491,270
1946	1,725,733
1949	2,058,271
1952	2,315,722
1955	2,485,938
1956	2,619,214
1957	2,824,095
1958	3,065,914
1959	3,098,849
1960	3,254,226
1961	3,357,255
1962	3,378,419

Source: U.S. Pulp Producers Assn.

Northeast mills survive on versatility

The pacesetting mills of the New England and Middle Atlantic states—and they are many—are probably best characterized by these words: Versatility and adaptability. From Pennsylvania to Maine, a number of mills are adding new processes and improving old one.

Examples of what some of the pacesetters are doing: Oxford Paper Co. has completed its changeover from sulfite to kraft. S. D. Warren has moved from soda pulping to an almost "odor-free" kraft process. St. Regis Paper Co's. Deferiet, N. Y., mill is pioneering its own high density groundwood bleaching system.

Gould Paper Co., another process pioneer, has doubled its groundwood-from-chips operations. Finch, Pruyn & Co., Inc. has added a second neutral sulfite pulp digester. Hammermill Paper Co. having developed Neutracel, is now according to its annual report working on Conifracel.

In the new machines category are Fraser Paper Ltd's. new fine paper machine at Madawaska, Maine; Byron Western Co. and International Paper Co., Ticonderoga, N. Y.; Brown Co's. new machine will make toilet and household tissues. Newton Falls Paper Mill, Inc. has started up a new high speed off-machine blade coater and New York and Pennsylvania Co., Inc. has modernized its on-machine coating at Johnsonburg, Pa.

NORTHEAST AND NORTH CENTRAL STATES PULPWOOD STATISTICS*

(In Thousands of Cords)

	Receipts				
	Domestic	*Imports*	*Total*	*Consumption*	*Yr. End Inventory*
1941	3,630	1,269	4,899	4,935	1,657
1945	3,676	1,101	4,777	4,689	1,075
1949	3,869	1,004	4,873	5,009	1,861
1950	3,940	1,060	5,000	5,497	1,300
1951	5,097	1,586	6,683	6,139	1,850
1952	4,881	1,422	6,303	5,724	2,260
1953	4,677	1,025	5,702	5,670	2,035
1954	4,643	1,095	5,738	5,805	1,640
1955	6,273	1,400	7,673	7,845	2,690
1956	7,265	1,477	8,742	8,351	3,095
1957	6,937	1,398	8,335	8,067	3,676
1958	6,060	1,101	7,161	7,671	3,146
1959	6,802	955	7,757	8,222	2,770
1960	7,716	936	8,652	8,553	2,924

**Prior to 1955 the figures are for regions which the Census Bureau and War Production Board designated as Northeastern and Appalachian.*

Source: APPA from Bureau of the Census

MIDDLE ATLANTIC STATES ANNUAL WOODPULP CAPACITY

(in short tons)

1934	981,305
1939	1,096,160
1946	1,038,893
1949	1,229,533
1952	1,315,572
1955	1,337,193
1956	1,420,007
1957	1,429,642
1958	1,481,640
1959	1,488,462
1960	1,380,465
1961	1,459,287
1962	1,462,651

Source: U.S. Pulp Producers Assn., Inc.

NEW ENGLAND ANNUAL WOODPULP CAPACITY

(in short tons)

1934	1,490,325
1939	1,096,160
1946	1,592,089
1949	1,655,041
1952	1,909,565
1955	1,972,983
1956	2,189,964
1957	2,266,324
1958	2,381,513
1959	2,399,013
1960	2,372,341
1961	2,391,924
1962	2,403,308

Source: U.S. Pulp Producers Assn., Inc.

PULPWOOD PRODUCTION IN MAINE—1960

(In Standard Cords)

	Hardwood		*Aspen*		*Spruce & Fir*		*Hemlock*		*Pine*		*Tamarack*		*Total*	
County	*Rough*	*Peeled*	*Rough*	*Peeled*	*Rough*	*Peeled*	*Rough*	*Peeled*	*Rough*	*Peeled*	*Rough*	*Peeled*	*Rough*	*Peeled*
Androscoggin	10,867	879	300	197	4,033	139	2,044	729	5,513	—	111	—	22,868	1,944
Aroostook	12,217	5,833	—	29,029	258,668	170,735	3,061	19,004	45	—	317	—	274,308	224,601
Cumberland	31,518	723	400	43	4,302	12,417	2,898	252	7,547	—	—	—	46,665	13,435
Franklin	30,421	5,795	—	3,782	61,368	3,884	2,773	1,264	386	—	141	—	95,089	14,725
Hancock	13,766	297	—	475	38,527	11,690	10,419	11,145	2,933	168	610	6	66,255	23,781
Kennebec	20,915	5,693	50	1,336	13,567	532	2,511	1,609	2,026	—	28	—	39,097	9,170
Knox	2,715	675	—	318	14,565	912	211	980	—	—	7	—	17,498	2,885
Lincoln	6,456	1,079	100	286	20,086	801	785	1,594	2,043	—	—	—	29,470	3,760
Oxford	102,274	3,266	50	346	71,902	2,912	6,982	1,097	4,427	—	182	—	185,817	7,621
Penobscot	58,967	7,154	—	5,198	109,922	31,567	15,184	40,773	1,738	39	1,874	36	187,685	84,767
Piscataquis	20,417	8,349	—	7,193	242,560	26,626	4,657	7,163	229	—	965	9	268,828	49,340
Sagadahoc	1,918	392	500	106	5,678	169	301	569	7,000	—	—	—	15,397	1,236
Somerset	29,486	10,055	—	3,421	243,392	36,114	3,278	6,286	82	8	623	—	276,861	55,884
Waldo	19,299	3,514	—	1,241	22,427	1,283	1,176	2,024	35	—	35	—	42,972	8,067
Washington	11,765	346	—	1,250	91,542	47,774	1,865	15,513	369	10	5,125	10	110,666	64,903
York	24,222	2,216	—	—	212	7	365	—	2,947	—	—	—	27,746	2,223
Totals	397,223	56,266	1,400	54,221	1,202,751	347,567	58,510	110,002	37,320	225	10,018	61	1,707,222	568,342
Conversion of "Peeled" to "Rough" Cords**	66,195		63,789		408,902		129,414		265		72		668,637	
Total	463,418		65,189		1,611,653		187,924		37,585		10,090		2,375,859	

42,390 cords of slabs and edgings for pulp chips obtained from Maine sawmills. This volume is *not* included in figures above.
Source: Maine Forest Service

Southern expansion levels off

In 1960, two new bleached foodboard machines came on line and in 1961, the long-awaited Tennessee River Pulp and Paper Co's. linerboard mill went into operation. The Crossett Co. went for on-machine foodboard coating in a big way, adding size press coating, blade and air knife coating on one machine.

As was to be expected, St. Francisville Paper Co., having ironed out the bugs on its machine coated publication and printing paper machine, announced plans for a second two-side coating paper machine. Bowaters Carolina is putting in a "worth-watching" pulp and paper mill at its Catawba, S. C. mill. In one 1300 ft. long building, pine logs will come in one end, will be processed by a groundwood pulp operation, will proceed to the paper machine and then will be off-machine coated—for publication grades—and be shipped from the other end. St. Mary's new board machine was starting up soon. Union Bag-Camp Paper Corp. put into operation what has been described as one of the biggest production units in the industry. Brunswick Pulp & Paper Corp. is adding papermaking to its pulp mill at Brunswick, Ga. International Paper, biggest in the South, was expanding and improving its galaxy of Southern operations.

Southern stars of the year included the Marathon Corp's. Naheola, Ala. new bleached foodboard mill featuring on-machine blade coating; and the Continental Can Co's. Augusta mill featuring continuous pulping, cold caustic sold soda and on-machine coating. Nearby at Nixon, and using Augusta pulp, is the first glassine operation in the South, affiliated with Deerfield Glassine Co. of New England. Another pioneering venture in the South—the entry of Scott Paper Co. into the printing paper field with a new machine at Mobile.

Gunnar Nicholson is president of Tennessee River P&P, owned by three major paper groups. It has already made 650 tons per day and is considered one of the lowest capital cost mills of its size in modern times.

U.S. SOUTH—PULPWOOD
Receipts—Consumption—Inventories

(In thousands of cords)

Yr.	Receipts	Consumption	Yr. End Inventory
1941	6,400	6,227	334
1943	6,505	6,342	293
1945	7,153	7,208	145
1947	8,227	8,395	291
1949	9,060	9,255	670
1950	11,543	11,480	753
1951	12,844	12,854	772
1952	13,381	13,330	856
1953	14,959	14,752	1,089
1954	14,962	15,014	1,048
1955	18,708	19,027	921
1956	20,582	20,203	1,325
1957	20,023	20,308	1,055
1958	20,207	20,507	1,335
1959	22,682	22,832	1,146
1960	23,701	23,617	1,253

Source: APPA from Bureau of Census

Source: Bureau of the Census; except 1941-1943, by War Production Board; 1951-52—NPA, Pulp, Paper & Board Div.

SOUTH
ANNUAL WOODPULP CAPACITY

(in short tons)

1934	1,213,650
1939	3,399,170
1946	5,715,475
1949	7,496,004
1952	9,928,030
1955	12,458,547
1956	13,430,628
1957	14,780,786
1958	15,719,487
1959	16,229,965
1960	17,051,775
1961	17,640,534
1962	17,816,104

Source: U. S. Pulp Producers Assn., Inc.

PULPWOOD PRODUCTION STATISTICS FOR SOUTHERN STATES

(in cords)

Especially gathered and prepared by PULP & PAPER from U.S. Forest Service data.

	Virginia	North Carolina	South Carolina	Georgia	Florida	Southeast Total
1946	971,000	709,000	1,002,000	1,143,000	865,000	4,711,000
1947	1,025,400	765,200	948,400	1,215,200	881,700	4,835,900
1948	1,306,500	926,200	1,108,500	1,770,600	1,221,200	6,330,000
1949	895,200	802,100	1,012,200	1,790,500	1,036,100	5,536,100
1950	1,044,147	1,024,005	1,182,413	2,221,279	1,384,694	6,856,538
1951	1,326,333	1,304,540	1,251,045	2,370,143	1,490,325	7,742,386
1952	1,069,129	1,332,303	1,275,698	2,513,272	1,583,341	7,773,743
1953	1,267,347	1,528,929	1,446,157	2,879,168	1,674,864	8,796,465
1954	1,258,400	1,507,400	1,330,900	3,057,500	1,661,600	8,815,800
1955	1,406,320	1,573,972	1,513,313	3,759,540	1,828,541	10,081,686
1956	1,629,706	1,842,162	1,806,162	3,849,942	1,950,653	11,079,034
1957	1,487,926	1,900,021	1,791,436	3,812,951	1,991,922	10,983,756
1958	1,449,800	1,896,100	1,747,800	4,092,900	1,834,900	11,021,500
1959	1,643,472	1,834,074	1,709,922	4,354,499	1,979,341	11,521,308
1960	1,715,314	1,887,816	1,901,857	4,410,128	1,923,892	11,839,006

	Oklahoma	Texas	Arkansas	Louisiana	Southwest Total
1946	13,300	616,000	577,000	787,000	1,993,000
1947	29,900	711,100	596,600	870,300	2,207,900
1948	34,300	823,600	616,700	953,800	2,428,400
1949	37,900	790,900	561,300	759,800	2,149,900
1950	38,831	922,304	603,682	883,306	2,448,123
1951	44,618	1,158,371	613,792	1,110,961	2,927,742
1952	34,870	1,159,918	619,664	1,234,745	3,049,197
1953	41,028	1,210,704	780,982	1,375,500	3,408,214
1954	33,000	1,054,300	826,300	1,504,200	3,417,800
1955	38,073	1,203,775	876,999	1,650,152	3,768,999
1956	74,535	1,459,015	934,734	1,574,218	4,042,502
1957	59,904	1,421,346	1,042,386	1,564,184	4,087,820
1958	63,100	1,386,000	1,314,400	1,583,600	4,347,100
1959	38,097	1,120,048	1,192,363	1,612,062	3,962,570
1960	30,097	1,134,517	1,216,360	1,645,599	4,026,573

	Tennessee	Mississippi	Alabama	Total Mid-South	Total All-South
1946	135,000	1,238,000	756,000	2,130,000	8,844,000
1947	141,300	1,279,100	777,700	2,198,100	9,241,900
1948	181,700	1,433,900	981,900	2,597,500	11,358,900
1949	158,100	1,167,700	911,300	2,237,100	9,923,100
1950	143,958	1,665,863	1,321,204	3,131,025	12,435,686
1951	191,415	1,793,376	1,406,207	3,390,998	14,061,126
1952	268,438	1,861,388	1,608,609	3,738,435	14,561,375
1953	234,162	1,922,975	1,765,140	3,922,277	16,126,956
1954	240,300	1,963,800	1,831,900	4,036,000	16,269,600
1955	326,634	1,908,495	1,928,828	4,163,957	18,014,642
1956	392,156	2,069,033	1,601,466	4,062,655	19,685,236
1957	341,194	2,075,702	2,294,189	4,711,085	19,782,661
1958	354,600	1,885,000	2,624,600	4,864,200	20,252,800
1959	346,077	1,875,544	2,582,142	4,803,763	20,287,641
1960	353,422	1,774,353	2,593,664	4,721,439	20,587,018

Note—Because of rounding, state figures may not add up to totals.

Sources: Southern and Southeastern Forest Experiment Stations of U.S. Forest Service.

U.S.A. statistical tables

U.S. INDUSTRY GROWTH

(in Millions of Units)

	Pulpwood Consumption	Woodpulp Production	Woodpulp Consumption	Waste paper Consumption
1939	10.8 cords	7.0 tons	8.7 tons	4.4 tons
1950	23.7	14.8	16.5	7.9
1952	26.4	16.5	17.3	7.9
1953	28.1	17.5	18.7	8.8
1954	29.2	18.3	19.0	8.1
1955	30.9	20.8	22.4	10.2
1956	35.8	22.1	22.9	8.9
1957	35.7	21.8	23.3	8.4
1958	35.2	21.7	23.3	8.6
1959	38.7	24.3	25.1	9.4
1960	40.3	25.2	25.6	9.0

	Paper & board Production	Woodpulp Imports	Newsprint Imports
1939	13.5 tons	2.0 tons	2.6 tons
1950	24.3	2.4	4.9
1952	24.4	1.9	5.0
1953	26.6	2.2	5.0
1954	26.9	2.1	5.0
1955	30.2	2.2	5.2
1956	31.4	2.3	5.6
1957	30.7	1.8	5.2
1958	30.7	2.1	4.8
1959	34.0	2.4	5.2
1960	34.2	2.4	5.4

PRODUCTION WORKERS AND WAGES IN U.S. PULP, PAPER AND ALLIED PRODUCTS INDUSTRIES

Year	Average number of wage earners (Thousands)	Total dollar wages (Millions)
1899	94	36
1909	145	68
1919	203	208
1929	229	281
1939	265	310
1949	382	1,111
1951	420	1,436
1953	442	1,670
1954	439	1,690
1955	453	1,893
1956	463	2,147
1957	467	2,238
1958	439	2,027
1959	449	2,195
1960	448	2,230

Source: U. S. Bureau of Labor Statistics. Source of data prior to 1939: Bureau of Census.

BASIC U.S. PRODUCTION AND CONSUMPTION DATA

	PAPER		WOODPULP			
	Production (tons)	Consumption (tons)	Production (tons)	Consumption For Paper Only (tons)	Consumption All Purposes (paper, rayon, cellophane, film, plastics, etc.,—tons)	PULPWOOD Consumption (cords)
1899	2,167,593	2,158,000	1,179,525	1,216,254	.....	1,986,310
1909	4,216,708	4,224,000	2,495,523	2,856,593	.....	4,001,607
1919	6,190,361	6,479,490	3,517,952	4,113,911	.....	5,477,832
1929	11,140,235	13,347,925	4,862,885	6,704,341	.....	7,645,011
1934	9,186,266	11,185,682	4,436,128	5,969,633	.....	6,796,659
1938	11,327,000	13,488,300	5,933,560	7,975,000	.....	9,193,991
1942	17,083,862	19,608,862	10,783,430	11,038,020	.....	17,204,000
1946	19,277,667	22,509,788	10,605,225	12,092,093	12,605,093	17,817,560
1948	21,897,301	26,082,093	12,872,292	14,374,586	15,034,586	21,189,458
1949	20,315,436	24,694,482	12,171,786	13,606,387	14,181,387	19,949,440
1950	24,375,468	29,012,144	14,810,860	16,483,201	17,183,201	23,627,000
1951	26,046,697	30,562,484	16,494,000	17,704,000	18,480,000	26,576,000
1952	24,418,383	29,106,854	16,472,979	17,274,000	18,041,008	26,476,110
1953	26,604,583	31,360,104	17,537,295	18,681,713	19,480,837	28,150,003
1954	26,876,242	31,379,024	18,341,175	19,033,994	19,900,794	29,201,000
1955	30,153,596	34,694,537	20,739,696	21,453,766	21,484,000	33,332,000
1956	31,428,155	36,477,976	22,117,998	22,945,491	23,867,391	35,752,000
1957	30,700,008	35,296,722	21,789,071	22,540,735	23,617,406	35,452,000
1958	30,797,000	35,299,837	21,734,000	22,505,000	23,347,000	34,761,462
1959	34,007,068	38,717,326	24,383,000	25,157,000	26,087,284	38,691,000
1960	34,282,000	38,986,061	25,188,000	25,617,000	26,486,000	40,301,000

Source: American Paper and Pulp Assn.; U. S. Census Bureau; U. S. Pulp Producers Assn.

SUMMARY OF FINANCIAL DATA OF PAPER AND ALLIED PRODUCTS

	Total Assets	Net Worth	Net Sales	Net Profit before Taxes	Federal Taxes	Net Profit after Taxes	% to Net Sales	% to Net Worth	Ratio of Sales to Total Assets
	(Millions of Dollars)								
1930	2,524	1,849	1,510	63	8	54	3.6	2.9	.6
1935	2,197	1,555	1,453	73	13	60	4.1	4.0	.65
1940	2,352	1,707	2,006	182	52	130	6.5	7.6	.9
1945	2,854	2,129	3,517	343	198	145	4.1	6.8	1.25
1950	5,277	3,816	6,839	1,008	452	556	8.1	14.6	1.3
1951	6,278	4,305	8,277	1,334	800	533	6.4	12.4	1.3
1952	6,395	4,487	7,723	946	534	412	5.3	9.2	1.2
1953	6,669	4,709	8,239	939	516	423	5.1	9.0	1.25
1954	7,184	5,066	8,429	893	453	440	5.2	8.5	1.2
1955	8,129	5,623	9,811	1,139	564	575	5.9	9.9	1.2
1956	8,923	6,168	10,682	1,325	645	680	6.4	10.7	1.2
1957	9,368	6,363	10,803	1,009	503	505	4.7	7.8	1.15
1958	9,700	6,563	10,730	882	448	434	4.0	6.6	1.1
1959	9,721	6,642	11,824	1,204	585	619	5.2	9.3	1.2
1960*	10,087	6,956	11,764	1,135	546	587	5.0	8.4	1.2

*1960 data preliminary. *Source:* APPA, based on U.S. Treasury Department Statistics of Income and FTC-SEC Quarterly Financial Reports

TOTAL PAPER PRODUCTION IN UNITED STATES BY GRADES

(Tons of 2,000 lbs.)

Year	Newsprint	Book	Groundwood	Fine	Wrapping (Coarse)	Tissue	Sanitary	Absorbent	Building Paper	Other Paper	Total All Paper	Total Paper and Board
1899	569,121	304,459	*	131,456	535,252	28,406	*	*	*	*204,697	1,773,482	2,167,593
1924	1,481,425	1,050,000	*	422,000	1,235,000	242,000	*	*	*	*649,560	5,079,985	7,929,985
1940	1,056,304	1,655,423	550,453	735,753	2,500,818	733,894		129,410	682,460	60,120	8,104,635	14,483,709
1945	725,475	1,501,015	636,026	1,000,794	2,403,182	157,083	823,705	88,643	883,259	238,047	8,457,229	17,370,955
1950	1,013,346	4,303,729		1,569,564	3,946,578	238,839	1,148,351	126,690	1,424,633	340,903	12,063,942	24,375,468
1951	1,108,165	3,302,861		1,198,574	3,285,635	225,199	1,215,258	124,412	1,385,691	419,036	13,010,418	26,046,697
1952	1,108,723	3,514,061		1,366,425	3,627,072	270,138	1,148,000	118,000	1,298,799	396,698	12,197,165	24,418,383
1953	1,068,661	3,576,338		1,298,675	3,397,782	231,166	1,385,895	*	1,428,349	500,525	13,077,821	26,876,242
1954	1,202,413	3,385,179		1,296,020	3,237,885	209,000	1,277,494	127,644	1,317,253	538,249	12,739,244	26,604,583
1955	1,459,017	3,937,795		1,449,980	3,686,816	1,761,036			1,597,954	610,270	12,904,914	30,178,102
1956	1,620,146	4,304,013		1,575,468	3,947,898	1,859,861			1,428,395	682,736	13,990,122	31,441,192
1957	1,806,576	4,032,679		1,515,605	3,654,576	1,912,000			1,328,642	659,081	13,580,517	30,666,469
1958	1,725,965	4,052,435		1,538,657	3,612,710	1,945,319			1,389,429	641,822	13,516,908	30,842,939
1959	1,924,456	4,486,924		1,749,070	3,994,170	2,120,237			1,468,694	750,059	15,024,916	34,007,068
1960	2,010,000	4,725,000		1,771,000	3,923,000	2,203,000			1,350,000	735,000	15,367,000	34,282,000

* In 1899 and 1924 groundwood, absorbent, sanitary and building papers are included in "Other Paper." Beginning in 1948, groundwood included with book. In 1954, absorbent included in "Other Paper." In 1955, sanitary and tissue are combined.
Source: APPA

U.S. PULPWOOD STATISTICS
Receipts—Consumption—Inventories

(In Thousands of Cords)

Year	Receipts Domestic	Receipts Imp'ts	Receipts Total	Consum.	Yr. End Invent.
1941	14,177	2,281	16,458	16,580	3,729
1943	13,581	1,712	15,293	15,645	2,846
1945	15,254	1,729	16,983	16,912	2,627
1947	18,529	2,084	20,613	19,714	4,563
1949	17,547	1,706	19,252	19,916	4,877
1950	20,712	1,834	22,546	23,627	3,615
1951	25,128	2,650	27,778	26,522	5,072
1952	25,045	2,315	27,358	26,462	5,949
1953	26,339	1,548	27,887	28,150	5,650
1954	26,973	1,624	28,597	29,201	5,058
1955	30,894	1,928	32,822	33,332	4,745
1956	35,196	1,973	37,169	35,852	6,229
1957	33,942	1,841	35,783	35,452	6,629
1958	34,133	1,822	35,955	34,761	5,953
1959	36,716	1,345	38,061	38,691	5,173
1960	39,541	1,412	40,953	40,301	5,948

Source: APPA from Bureau of Census

U.S.A.
ANNUAL WOODPULP CAPACITY
(in short tons)

1934	7,006,310
1939	9,087,030
1946	12,310,164
1949	15,017,813
1952	18,771,390
1955	22,407,489
1957	27,170,000
1959	28,846,000
1960	29,643,263
1961	30,780,341
1962	31,286,532

Source: U.S. Pulp Producers Assn.

PULP PRODUCTION BY REGIONS
(with figures as available for certain states)

1959

	Tons
Northeast	2,919,623
New England	1,899,526
Maine	1,520,380
Middle Atlantic	1,020,097
New York	520,934
New Jersey	72,912
Pennsylvania	426,251
North Central	2,698,894
East North Central	2,020,704
Ohio	149,462
Michigan	492,723
Wisconsin	1,228,752
West North Central	678,190
South	14,341,792
South Atlantic	8,510,778
Virginia	1,165,005
North Carolina	1,243,649
Georgia	2,420,556
Florida	2,373,800
East South Central	2,921,498
Alabama	1,312,997
West South Central	2,909,516
Louisiana	1,516,168
Texas	624,433
West	4,423,082
Washington	2,804,823
Oregon	1,023,136

*Includes Alaska

Source: U.S. Bureau of the Census

TOTAL UNITED STATES PRODUCTION OF WOODPULP

(Tons of 2000 pounds)

Production	Dissolving & Special Alpha	Sulphite Paper Grades Bleached	Sulphite Paper Grades Unbleached	Sulphate Paper Grades Bleached	Sulphate Paper Grades Semibleached	Sulphate Paper Grades Unbleached	Soda
				—215,150—			
1937	353,640	995,029	791,575			1,923,937	507,548
1940	326,729*	1,285,360*	995,700	453,282	131,332	3,163,378	532,387
1946	316,573*	1,375,504*	784,391	749,822	152,337	3,685,857	476,211
1948	419,683	1,489,719	901,814	1,040,055	224,751	4,748,890	509,864
1949	374,050	1,454,971	707,263	1,118,282	263,637	4,595,362	492,194
1950	478,849	1,628,692	740,895	1,432,945	359,917	5,708,567	522,221
1951	616,202	1,760,685	764,640	1,899,014	293,584	6,379,172	446,260
1952	706,033	1,691,523	673,453	2,082,844	275,062	6,210,798	425,415
1953	677,326	1,728,648	593,958	2,389,212	302,931	6,752,673	427,546
1954	784,883	1,816,389	587,675	2,683,021	328,667	6,800,366	429,596
1955	983,444	1,909,006	646,423	3,202,071	422,629	7,664,644	440,454
1956	940,945	2,002,065	684,339	3,658,935	488,478	7,983,398	478,624
1957	1,010,904	1,957,471	617,908	3,720,622	563,085	7,650,926	428,120
1958	929,125	1,849,206	532,255	4,067,371	601,978	7,647,099	429,167
1959	1,100,000	1,908,000	571,000	4,575,000	714,000	8,540,000	481,000
1960	1,132,000	2,046,000	533,000	5,060,000	826,000	8,630,000	420,000

	Total Chemical	Groundwood	Other Non-Chemical	Semichemical	Screenings	All Grades
	4,786,879	—1,600,667—		132,521	52,851	6,572,918
1937	6,888,168	1,632,727	210,148	164,940*	63,576*	8,959,559
1940	7,540,695	1,951,456	616,257	319,842*	178,277*	10,606,527
1946	9,334,776	2,175,107	744,671	477,861	139,877	12,872,292
1948	9,005,759	1,960,496	604,010	506,226	130,788	12,207,279
1949	10,872,086	2,215,883	934,666	685,906	140,410	14,848,951
1950	12,159,557	2,473,796	944,776	796,546	149,733	16,524,408
1951	12,065,128	2,321,124	1,117,904	828,917	139,906	16,472,979
1952	12,872,294	2,342,931	1,153,009	1,028,721	140,342	17,537,297
1953	13,430,597	2,484,963	1,027,525	1,197,984	161,204	18,302,273
1954	15,268,671	2,728,870	1,190,081	1,407,654	144,420	20,739,696
1955	16,236,784	3,041,012	1,171,201	1,546,714	135,238	22,130,949
1956	15,949,036	3,088,700	1,059,474	1,582,637	120,362	21,800,209
1957	16,056,201	2,889,879	1,132,898	1,622,028	94,646	21,795,652
1958	17,889,000	3,230,000	1,239,000	1,924,000	101,000	24,383,000
1959	18,647,000	3,247,000	1,222,000	1,970,000	102,000	25,188,000

* Estimated from U.S. Bureau of Census combined data.
Source: United States Bureau of the Census and U. S. Pulp Producers Assn. Inc.

U.S. PRICES OF DISSOLVING PULP
Dollars Per Short Ton

		Regular Tenacity Viscose	Standard High Tenacity Viscose	Acetate & Cupra
	1929	$ 97.00		
	1933	70.00		
Jan.	1938	97.50		100.00
Jan.	1946	107.50	112.50	117.50
Oct.	1949	150.00	161.00	171.00
Jan.	1951	185.00	195.00	225.00
May	1953	185.00	195.00	225.00
May	1954	185.00	195.00	225.00
July	1955	185.00	195.00	225.00
July	1956	185.00	195.00	225.00
July	1957	188.00	200.00	225.00
July	1958	185 to 188	195.00	205 to 225
July	1959	185 to 188	195.00	205 to 225
July	1960	175	182.50 to 185	207 to 225
July	1961	165 to 175	185 to 190	200

U.S. PRICES OF COTTON LINTERS PULP
Dollars Per Short Ton

	Annual Average	Low	High
1948	225.00	187.00	260.00
1950	337.00	187.00	546.00
1951	459.00	316.00	554.00
1952	288.00	223.00	316.00
1953	235.60	223.00	250.00
1954	210.00	210.00	210.00
1955	210.00	210.00	210.00
1956	215.00	206.00	220.00
1957	280.00		
1958	250.00		
1959	224.00 for sheets		219.00 bulk
1960	250.00 for sheets		245.00 bulk
1961	250.00 for sheets		245.00 bulk

TYPICAL PULP PRICES IN THE UNITED STATES
(Prepared especially by PULP & PAPER*)*

Before World War II—Under OPA Regulation (1944 and 1946 allowed increases are shown)—and in recent years. Specially prepared authentic table for this WORLD REVIEW.
Swedish and Norwegian prices are N. Y. *Dock* prices; U. S. and Canadian are *"Delivered"* and Maximum Freight Allowances are noted.

	Domestic Bleached Kraft	Canadian Bleached Kraft	Swedish Unbl'ched Kraft	Swedish Bleached Sulfite	Domestic Bleached Sulfite	Canadian Bleached Sulfite	Norway Bleached Sulfite	Canadian Unbl'ched Sulfite	Swedish Unbl'ched Sulfite
1939	—	—	$28	$43	$50	—	—	—	$36
1944	—	—	$69	$82	$86	$86	—	$75	$70
1946	—	—	$79	$91	$94	$94	—	$82	$79
Apr. 1949	$136	$136	$112	$132	$126	$130	$125	$118	$122
June 1951	$135 to $200 (1)	$195 (2)	$225	$250 to $290	$135 to $165	$160 (2) to $175 (2)	$250	—	$225 to $265
May 1953	$140 to $147.50	$145 to $155	$100 to $125	$130 to $135	$140	$140 to $145	$140 to $145	$130 to $135	$110 to $125
May 1954	$140 to $147.50	$145 to $150	$105 to $110	$135 to $140	$140	$140	$135 to $142.50	$120	$115 to $122
July 1955	$150	$150	$110 to $115	$142.50 to $145	$145	$145	$140 to $142.50	$125	$125 to $128
July 1956	$152 to $155	$152 to $155	$125	$150 to $155	$150	$150	$150 to $155	$130	$130
July 1957	$155	$155	$130	$145	$150	$150	$150 to $155	$130	$130
July 1958	$157 to $160	$157 to $160	$110 to $115	$140 to $145	$155	$155	$110 to $115	$130	$120 to $125
July 1959	$157 to $160	$157 to $160	$110 to $115	$140 to $145	$155	$155	$125	$135	$117.50 to $120
July 1960	$152 to $160	$157 to $160	$105 to $115	$155	$150 to $155	$150 to $155	$155	$135	$117 to $120
July 1961	$140 to $150		$105 to $110 dock	$135 to $140 del'd	$135 to $140 del'd			$125	$115 to $120 dock

Maximum Freight Allowances:
(1) $12.50 (2) $7.50 (3) $18.50 (4) $15.00

U.S. WOODPULP EXPORTS

	Tons	Value
1930	48,426	$ 2,070,553
1935	171,710	$ 8,632,971
1939	139,504	$ 6,493,140
1940	480,938	$ 29,736,737
1943	300,700	$ 20,288,879
1946	39,361	$ 3,645,963
1949	122,133	$ 14,082,575
1950	95,693	$ 12,056,311
1953	161,687	$ 22,793,371
1954	441,863	$ 62,337,237
1955	632,914	$ 87,491,601
1956	530,682	$ 81,330,276
1957	628,721	$ 95,829,046
1958	515,859	$ 77,867,947
1959	652,437	$ 94,839,931
1960	1,141,534	$153,839,775

Source: U. S. Department of Commerce and U. S. Pulp Producers Assn.

U.S. PULP IMPORTS

Year	Chemical Tons	Value (in thous. of dollars)	Mechanical Tons	Value (in thous. of dollars)
1925	1,332,522	$ 73,317	331,092	$ 8,517
1930	1,530,985	$ 73,962	299,256	$ 7,146
1936	2,049,722	$ 78,785	227,778	$ 4,051
1940	1,053,057	$ 55,474	170,909	$ 4,712
1945	1,526,647	$106,858	227,418	$ 8,936
1947	2,016,153	$238,126	290,514	$ 18,032
1949	1,554,320	$168,910	208,782	$ 12,099
1950	2,098,667	$224,358	286,308	$ 15,802
1951	2,046,311	$324,280	321,178	$ 26,414
1953	1,894,216	$244,670	263,630	$ 18,445
1954	1,807,897	$251,595	242,865	$ 17,593
1955	1,958,422	$253,729	254,524	$ 18,620
1956	2,048,380	$276,504	270,916	$ 20,315
1957	1,862,076	$251,229	228,747	$ 16,981
1958	1,891,233	$261,154	199,110	$ 14,603
1959	2,202,557	$298,392	229,472	$ 16,302
1960	2,384,422	$286,090	262,283	$ 19,090

Source: U. S. Pulp Producers Assn., U. S. Dept. of Commerce

CONSUMPTION OF WASTE FIBROUS MATERIAL BY U.S. MILLS

(In Thousands of Tons)

	Waste Paper	Rags	Straw, Flax and Other	Total
1939	4,366	468	692	5,526
1944	6,859	428	957	8,245
1946	7,278	403	980	8,660
1948	7,649	425	1,075	9,149
1949	6,600	382	833	7,815
1950	7,956	442	998	9,395
1951	9,070	389	1,055	10,523
1952	7,881	325	871	9,007
1953	8,530	325	930	9,785
1954	8,064	317	895	9,276
1955	8,976	343	976	10,295
1956	8,860	300	883	10,124
1957	8,493		1,106	9,599
1958	8,670		1,003	9,674
1959	9,414		980	10,394
1960	9,021		968	9,989

Source: Pulp and Paper Sec., Forest Products Div., Office of Domestic Commerce and NPA, Pulp, Paper, and Paperboard Div.

U.S. WOODPULP PRODUCTION—1959 vs. 1960

	Total Woodpulp All Grades			Market Woodpulp All Grades		
	1959	1960	% Change	1959	1960	% Change
Capacity	28,846,156	29,643,263	+ 3			
Production	24,383,391	25,188,000	+ 3	2,580,851	3,012,390	+17
Imports	2,431,692	2,381,932	− 2	1,590,833	1,493,066	− 6
Canada				1,134,791	1,143,520	+ 1
Europe				456,042	349,546	−23
Exports	627,739	1,137,447	+81	627,739	1,137,447	+81
New Supply	26,187,344	26,432,485	+ 1	3,543,945	3,368,009	− 5
Consumption in paper & board	25,155,362	25,617,000	+ 2	2,678,741	2,747,839	+ 3
Inventory, Dec. 31	771,987	828,108	+ 7	514,701	506,722	− 2
at pulp mills	235,295	294,249	+25	138,725	163,996	+18
at paper and board mills	536,692	533,859	− 1	375,966	342,726	− 9

Source: U.S. Pulp Producers Assn.

U.S. WOODPULP CAPACITY

(Short tons)

	1959	1960	1961	1962
Total	28,373,621	29,823,123	30,780,341	31,286,532
Dissolving & Spec. Alpha	1,324,694	1,467,184	1,468,825	1,428,825
Sulfite, Paper Grades	3,012,189	2,947,827	2,910,010	2,926,986
Bleached	2,368,532	2,317,346	2,305,275	2,321,918
Unbleached	643,657	630,481	604,735	605,068
Sulfate, Paper Grades	15,153,600	15,892,008	16,939,923	17,338,871
Bleached	5,176,551	5,042,651	5,207,127	5,263,582
Semibleached	640,890	1,071,089	1,625,607	1,648,579
Unbleached	9,336,159	9,778,268	10,107,189	10,426,710
Soda & Semichemical	2,823,028	3,359,773	3,297,336	3,330,758
Groundwood	4,284,577	4,269,699	4,336,184	4,432,257
Bleached	707,726	730,721	899,906	919,086
Unbleached	3,576,851	3,538,978	3,436,278	3,513,171
Defibrated & Exploded	1,709,735	1,825,313	1,747,879	1,748,651
Screenings	65,798	61,319	80,184	80,184

Source: U.S. Pulp Producers Assn., Inc.

U.S. WOODPULP IMPORTS FROM EUROPE

(Short Tons)

	Sweden	Finland	Norway	Austria	Czech.	France	Ger.	Switz.	Total**
1945*	672,261	0	0	0	0	0	0	0	672,261
1946	445,114	115,220	0	0	0	0	0	0	560,334
1947	555,215	223,973	9,577	0	0	0	0	0	793,693
1948	384,576	175,900	13,218	1,696	0	0	0	0	575,390
1949	265,621	148,903	29,208	4,459	1,027	0	0	0	449,218
1950	398,814	205,651	28,958	21,005	2,597	115	977	89	668,146
1952	189,613	145,630	21,168	2,430	0	124	169	0	359,138
1953	334,813	160,216	36,777	9,996	0	211	588	0	542,601
1954	224,471	132,792	14,997	0	0	50	0	0	372,310
1955	189,845	144,982	13,696	0	0	55	0	0	348,578
1956	213,332	153,618	9,335	554	0	0	0	0	376,879
1957	163,313	97,168	5,985	0	0	0	0	0	266,287
1958	183,589	84,466	28,995	0	0	0	0	0	297,060
1959	281,485	128,815	28,813	0	0	73	1,615	0	439,370
1960	203,585	117,311	17,422	0	0	50	846	0	***349,540

* The 1945 figure is for only 6 mos., when shipping reopened after the war.

** Includes 167 tons from Italy in 1950; 4,928 tons from Russia in 1947 and 9,773 tons from Russia in 1950; 4 tons from Australia in 1952; 12 tons from Italy and 28 tons from the Netherlands in 1956. Also, 1,896 tons from U.S.S.R., 110 tons from Latvia, 12,359 tons from U. of South Africa.

*** 1960 total includes 173 tons from The Netherlands and 10,153 tons from Union of So. Africa.

U.S. IMPORTS OF NORTH AMERICAN WOODPULP BY GRADES

(Short Tons)

Includes: Canada, Newfoundland, Labrador, Mexico

	Bleached Sulfite Paper Grades	Bleached Sulfite Non-Paper Grades	Unbleached Sulfite	Bleached Sulfate Paper Grades	Bleached Sulfate Non-Paper Grades	Semi-Bleached Sulfate	Unbleached Sulfate	Groundwood Bleached	Groundwood Unbleached	Soda	Screenings	Total
1952	215,296	220,010	306,929	452,112		—	135,823	31,622	183,089	28,071	8,262	1,581,214
1953	234,079	254,232	254,322	470,502		—	154,580	57,298	145,391	34,883	8,378	1,613,665
1954	246,475	228,143	266,959	539,126		11,324	141,058	53,613	147,975	37,936	6,839	1,679,448
1955	338,918	214,525	290,850	556,366	9,816	29,746	165,171	40,795	178,244	41,260	8,846	1,864,721
1956	369,670	190,604	306,711	561,874	16,858	44,671	185,275	44,895	201,924	42,669	8,293	1,956,592
1957	351,802	126,727	228,891	593,363	10,740	62,417	199,331	31,506	183,710	36,955	7,193	1,832,665
1958	351,741	122,492	161,112	709,270	16,070	50,674	187,705	16,815	170,093	27,320	5,961	1,819,253
1959	328,938	161,073	121,185	802,629	11,607	90,510	237,396	16,855	179,860	27,630	5,584	1,983,267
1960	383,171	167,662	90,918	782,851	53,070	90,047	175,930	17,886	233,386	32,064	7,780	2,034,765

Source: Bureau of the Census and U.S. Pulp Producers Assn.

U.S. IMPORTS OF EUROPEAN WOODPULP BY GRADES

(Short Tons)

	Bleached Sulfite Paper Grades	Bleached Sulfite Non-Paper Grades	Unbleached Sulfite	Bleached Sulfate	Semi-bleached Sulfate[1]	Unbleached Sulfate	Groundwood	Total[2]
1946	27,541	12,417	207,059	23,484		260,434	29,399	560,334
1950	115,020	8,262	163,975	86,548		257,160	34,618	668,146
1952	59,774	3,317	125,623	70,568		72,103	27,529	359,138
1954	41,955	2,230	73,451	95,681	13,260	104,210	37,328	372,310
1955	35,254	347	68,030	80,234	12,544	116,865	32,106	348,578
1956	37,416	111	83,180	87,060	19,536	118,825	23,525	376,879
1957	32,117	280	51,778	65,180	18,037	79,134	11,610	266,287
1958	60,273	2,335[3]	56,254	70,979	11,864	63,326	12,202	282,486
1959	109,452	335	70,433	91,041	14,486	121,537	28,103	439,370
1960	79,441	1,087	77,241	69,052	10,600	87,304	11,011	33,426

[1] Prior to 1954, included in Unbleached Sulfate. [2] Total includes screenings and soda. [3] From Union of South Africa.
Source: Bureau of the Census.

U.S. PAPER PRODUCTION, IMPORTS, EXPORTS, AND CONSUMPTION

(All Grades—in tons of 2,000 lbs.)

Year	Production	Imports**	Exports**	Consumption Tons	Consumption Lbs/Capita
1899	2,167,593	.....	.....	2,167,593	57.9
1909	4,121,495	55,962	74,764	4,102,693	90.5
1919	5,966,076	707,548	420,540	6,253,084	119.1
1929	11,140,235	2,533,603	262,383	13,411,455	220.3
1939	13,509,642	2,687,484	248,569	15,948,557	243.7
1942	17,083,862	3,038,499	341,920	19,780,441	293.8
1945	17,370,965	2,753,211	458,689	19,665,487	281.7
1948	21,897,301	4,581,811	397,019	26,082,093	355.9
1949	20,315,436	5,751,323	372,277	24,694,482	331.0
1950	24,375,468	5,008,222	371,546	29,012,144	382.4
1951	26,046,697	5,151,090	635,303	30,562,484	395.7
1952	24,418,383	5,190,859	592,388	29,106,854	369.7
1953	26,604,583	5,230,866	475,345	31,360,104	393.0
1955	30,153,596	5,386,174	845,233	34,694,537	419.8
1956	31,428,155	5,836,030	786,209	36,477,976	434.1
1957	30,700,008	5,466,427	869,713	35,276,262	412.4
1958	30,842,939	5,148,634	853,010	35,138,563	403.8
1959	34,007,068	5,622,175	911,917	38,717,326	436.8
1960	34,282,000	5,724,645	1,020,584	38,986,061	431.6

**Quantities estimated, wholly or in part, from values given. Imports and exports for various grades include 'Paper Products.'
Source—U. S. Census Bureau; APPA

U.S.—ALL PAPER (INCLUDING NEWSPRINT)

(In Thousands of Tons)

	Produced	Imports	Exports	Consumption Tons	Consumption Lbs. per Capita
1899	1,676,567	——	——	1,676,567	44.8
1914	3,616,992	349,278	106,713	3,859,557	77.9
1924	4,729,985	1,443,874	97,305	6,076,554	106.5
1934	4,845,187	2,252,345	110,597	6,986,935	110.0
1939	6,825,058	2,658,222	130,829	9,352,451	142.8
1944	7,338,990	2,523,174	225,718	9,636,446	139.3
1949	9,198,795	4,680,346	234,047	13,645,094	182.9
1950	10,638,692	4,919,410	225,155	15,332,947	202.2
1951	11,624,727	5,032,592	346,901	16,310,418	211.3
1952	10,898,366	5,104,489	383,184	15,619,671	198.9
1953	11,367,858	5,102,528	238,277	16,232,109	203.4
1954	11,648,672	5,088,699	377,837	16,359,534	201.5
1955	12,904,914	5,267,993	475,023	17,697,884	214.1
1956	13,990,122	5,715,189	399,238	19,306,073	229.5
1957	13,580,517	5,343,085	448,111	18,475,491	215.8
1958	13,516,908	5,017,065	411,179	18,122,794	208.2
1959	15,024,916	5,439,626	392,258	20,072,184	226.4
1960	15,367,000	5,576,974	427,561	20,516,323	227.1

Source: APPA.

U.S.—NEWSPRINT

(In Thousands of Tons)

	Produced	Imp'ts	Exp'ts	Consumption Tons	Consumption Lbs. per Capita
1899	569	....	...	569	15
1914	1,313	278	44	1,547	32
1924	1,481	1,357	17	2,821	50
1934	989	2,209	23	3,175	50
1941	1,043	2,982	70	3,956	60
1947	833	3,957	28	4,762	66
1950	1,013	4,863	44	5,832	76.9
1951	1,109	4,963	71	5,999	77.7
1952	1,109	5,033	105	6,037	76.9
1953	1,069	5,004	47	6,026	75.5
1954	1,202	4,992	140	6,054	74.6
1955	1,459	5,159	207	6,411	77.6
1956	1,620	5,570	152	7,037	83.7
1957	1,807	5,223	173	6,857	80.1
1958	1,726	4,883	127	6,481	74.5
1959	1,924	5,263	120	7,067	79.7
1960	2,010	5,410	135	7,286	80.7

Source: APPA

U.S. COARSE PAPERS

(In Thousands of Tons)

	Produced	Imp'ts	Exp'ts	Consumed Tons	Consumed Lbs. per Capita
1899	535	..	...	535	14
1914	911	18	7	922	18.8
1924	1,235	25	18	1,242	22
1934	1,356	5	32	1,329	21
1943	2,262	1	49	2,213	32
1947	2,903	22	51	2,874	40
1949	2,758	6	56	2,708	36
1950	3,297	11	83	3,225	42.5
1951	3,623	11	127	3,507	45.4
1952	3,234	11	122	3,123	39.8
1953	3,385	36	73	3,347	41.9
1954	3,462	36	93	3,405	41.9
1955	3,687	40	103	3,624	43.8
1956	3,948	48	91	3,905	46.4
1957	3,655	41	108	3,588	41.9
1958	3,613	54	114	3,553	40.8
1959	3,994	81	93	3,982	44.9
1960	3,923	66	105	3,884	43.0

Source: APPA, Census Bureau

U.S. FINE PAPERS

(In Thousands of Tons)

	Produced	Imp'ts	Exp'ts	Consumed Tons	Consumed Lbs. per Capita
1899	131	..	..	131	3
1914	269	..	3	266	5
1924	422	1.3	4	419	7
1934	434	.8	10	425	7
1941	950	2	46	903	14
1947	1,171	.6	68	1,103	15
1950	1,197	1.4	43	1,156	15.2
1951	1,366	1.6	54	1,314	17.0
1952	1,296	1.7	47	1,251	15.9
1953	1,299	3.6	40	1,262	15.8
1954	1,285	2.6	47	1,240	15.3
1955	1,450	5.4	47	1,409	17.0
1956	1,575	6.3	39	1,543	18.3
1957	1,516	7.4	45	1,478	17.3
1958	1,539	9.0	38	1,509	17.3
1959	1,749	13.8	38	1,725	19.5
1960	1,771	12.9	40	1,744	19.3

From 1899 to 1940 inclusive, only writing and cover were in fine papers. Beginning 1941, text papers (from book), bristol (from paperboard), and "thin papers" (from tissue) have been added.
Source: APPA, Census Bureau.

U.S.—TISSUE PAPERS

(In Thousands of Tons)

	Produced	Imp'ts	Exp'ts	Consumed Tons	Consumed Lbs. per Capita
1899	28	..	..	28	1
1914	115	..	..	115	2
1924	242	6	4	244	4
1934	397	8	7	398	6
1941	912	.07	25	889	13
1947	1,088	1	18	1,071	15
1950	1,365	.5	13	1,353	17.8
1952	1,357	.3	18	1,339	17.1
1953	1,505	.7	21	1,485	18.6
1954	1,612	1.8	22	1,592	19.6
1955	1,761	.9	24	1,738	21.0
1956	1,860	3.0	25	1,838	21.9
1957	1,912	1.9	26	1,888	22.0
1958	1,945	1.7	27	1,920	22.1
1959	2,120	2.0	27	2,096	23.6
1960	2,203	2.8	25	2,181	24.1

Source: APPA, Census Bureau

U.S. PRINTING PAPERS (including Book and Groundwood)

(In Thousands of Tons)

	Produced	Imp'ts	Exp'ts	Consumption Tons	Consumption Lbs. per Capita
1899	304	..	..	304	8
1914	795	6	14	788	16
1924	1,050	14	10	1,053	18
1934	1,055	4	12	1,047	16
1941	2,025	28	51	2,002	30
Beginning 1941, text papers allocated to fine papers.					
1947	2,207	74	76	2,206	31
Beginning 1948 Groundwood Papers included with Book Paper. Groundwood was in All Other Paper					
1950	3,305	38	27	3,316	43.7
1951	3,514	51	52	3,512	45.5
1952	3,385	48	66	3,367	42.9
1953	3,556	43	27	3,572	44.8
1954	3,587	40	41	3,587	44.2
1955	3,937	46	50	3,933	47.6
1956	4,304	63	45	4,322	51.4
1957	4,033	48	47	4,033	47.1
1958	4,052	48	52	4,048	46.5
1959	4,487	53	57	4,483	50.6
1960	4,725	53	55	4,723	52.3

Source: APPA, Census Bureau

U.S.—ALL OTHER PAPER

(In Thousands of Tons)

	Produced	Imp'ts	Exp'ts	Consumed Tons	Consumed Lbs. per Capita
1899	53	..	..	53	1.4
1914	107	46	37	116	2.3
1924	129	31	40	120	2.1
1934	298	14	22	290	4.6
1943	296	3	15	283	4.2
1947	389	3	38	354	4.9
1950	460	5	15	451	5.9
1951	540	9	21	528	6.8
1952	517	11	26	502	6.4
1953	554	16	31	540	6.8
1954	501	16	35	481	5.9
1955	610	16	43	584	7.1
1956	683	21	47	657	7.8
1957	659	21	49	632	7.4
1958	642	21	53	610	7.0
1959	750	28	59	720	8.1
1960	735	32	69	698	7.7

Source: APPA.—Up to 1948, included groundwood. Since then, groundwood included in book.

U.S. NEWSPRINT CONSUMPTION

	Population	Newsprint Tons	Paper Used Per Capita Lbs.
1924	113,090,000	2,821,499	49.5
1930	123,091,000	3,495,534	56.9
1935	127,521,000	3,308,511	52.0
1940	132,817,000	3,774,926	57.2
1945	139,621,000	3,350,623	48.0
1947	143,382,000	4,762,981	66.1
1948	146,116,000	5,243,670	71.6
1949	149,215,000	5,518,680	74.1
1950	151,376,000	5,832,375	77.0
1952	155,300,000	6,036,739	76.9
1953	160,873,000	6,026,036	75.5
1954	162,400,000	6,054,067	74.6
1955	167,181,000	6,410,529	77.6
1956	170,700,000	7,037,447	83.7
1957	172,100,000	6,856,630	80.1
1958	173,888,000	6,481,375	74.5
1959	179,017,000	7,067,358	79.7
1960	182,018,000	7,285,893	80.7

U.S.A. CERTIFIED TREE FARMS as of May 1, 1961

State	Tree Farms	Acreage
Ala.	1,744	5,504,440
Ariz.	4	70,243
Ark.	1,007	3,582,446
Calif.	345	2,840,236
Colo.	8	79,252
Conn.	55	53,554
Del.	1	176
Fla.	508	5,551,824
Ga.	811	5,069,085
Idaho	656	1,002,452
Ill.	178	19,956
Ind.	357	60,352
Iowa	109	7,767
Ky.	123	100,448
La.	1,315	3,816,299
Me.	449	310,005
Md.	30	20,328
Mass.	187	71,308
Mich.	732	1,226,227
Minn.	1,244	626,473
Miss.	2,748	2,785,457
Mo.	110	178,802
Mont.	61	967,348
Neb.	30	2,092
Nev.	1	12,984
N.H.	281	198,385
N.J.	27	12,796
N.M.	4	155,040
N.Y.	176	118,584
N.C.	721	1,476,020
N.D.	134	2,446
Ohio	549	116,787
Okla.	135	987,902
Ore.	407	4,269,657
Pa.	602	280,136
R.I.	51	7,993
S.C.	433	1,870,120
S.D.	197	33,213
Tenn.	628	1,085,082
Texas	1,427	3,815,620
Utah	1	2,960
Vt.	68	143,791
Va.	415	1,019,863
Wash.	711	4,196,464
W.Va.	70	249,203
Wis.	253	1,152,247
Wyo.	2	40,672
TOTALS	20,105	55,194,535

Note: Private industry founded and developed the important Tree Farm movement in U.S. First Tree Farm was Clemons Tree Farm, Montesano, Wash., 1941.

U.S. NEWSPRINT SUPPLY AND SOURCES

	In thousands of short tons				Percentages		
	from Canada	from U.S.A.	from Europe	Total	from Canada	from U.S.A.	from Europe
1915	367	1,184	1	1,552	24	76	0
1925	1,315	1,507	133	2,955	45	51	4
1930	2,145	1,272	134	3,551	60	36	4
1935	2,122	911	197	3,230	66	28	6
1940	2,741	998	34	3,773	73	26	1
1945	2,666	707	nil	3,373	79	21	0
1949	4,380	884	255	5,519	79	16	5
1952	4,855	1,065	190	6,110	79	18	3
1953	4,861	1,037	164	6,062	80	17	3
1954	4,875	1,085	140	6,100	80	18	2
1955	5,025	1,270	125	6,420	78	20	2
1956	5,230	1,582	311	7,123	73	22	4
1957	5,055	1,698	155	6,908	73	25	2
1958	4,826	1,675	108	6,611	73	25	2
1959	5,118	1,909	124	7,151	71	27	2
1960	5,260	1,954	147	7,360	71	27	2

U.S. KRAFT, SEMICHEMICAL, OTHER PAPERBOARD PRODUCTION

YEARS	Kraft paperboard Tons	Kraft paperboard Percent	Semichemical paperboard Tons	Semichemical paperboard Percent	All other paperboard Tons	All other paperboard Percent
Average 1926-29	134,300	3.6	24,025	.6	3,596,325	95.8
Average 1930-39	758,630	16.7	95,130	2.1	3,678,450	81.2
Average 1940-45	1,900,400	25.4	227,533	3.0	5,364,384	71.6
Average 1946-50	2,583,975	28.2	481,600	5.3	6,097,225	66.5
1951	4,115,200	34.6	853,000	7.2	6,923,000	58.2
1952	4,141,300	37.5	857,900	7.8	6,050,300	54.7
1953	4,829,200	38.5	1,056,000	8.4	6,659,000	53.1
1954	4,820,800	39.2	1,119,700	9.1	6,345,400	51.7
1955	5,665,000	40.3	1,368,300	9.8	7,010,400	49.9
1956	5,984,500	41.6	1,477,500	10.3	6,909,600	48.1
1957	5,976,400	42.1	1,490,800	10.5	6,719,500	47.4
1958	6,152,300	43.3	1,450,600	10.2	6,613,200	46.5
1959	7,122,500	44.6	1,774,700	11.1	7,060,600	44.3
1960	7,264,400	45.6	1,815,500	11.4	6,850,100	43.0

Source: National Paperboard Assn.

U.S. PAPERBOARD STATISTICS

(In Tons of 2,000 lbs.)

Year	Production	Imports	Exports	Consumption	Per Capita Consumption Lbs.
1899	394,111	.....	.....	394,111	10.5
1909	883,088	.....	.....	883,088	19.5
1919	1,867,064	44,461	61,890	1,849,635	35.2
1929	4,221,625	2,749	58,041	4,166,333	68.4
1939	5,910,989	12,793	82,958	5,840,824	89.2
1948	9,366,289	45,458	112,376	9,299,371	126.8
1949	8,996,777	48,657	101,846	8,943,588	119.9
1950	10,925,721	56,028	111,341	10,870,408	145.4
1951	11,620,048	81,387	249,552	11,451,883	150.2
1952	10,771,806	58,035	173,322	10,656,519	137.5
1953	12,334,536	100,103	203,234	12,231,405	155.2
1954	12,190,790	55,016	272,419	11,973,387	149.1
1955	13,866,599	44,957	329,560	13,581,996	164.4
1956	14,234,093	31,978	338,141	13,927,930	165.7
1957	14,061,731	45,370	378,955	13,728,146	160.4
1958	14,149,930	46,516	406,151	13,790,305	158.5
1959	15,456,492	44,048	481,806	15,018,734	169.5
1960	15,634,000	36,752	555,982	15,114,770	167.3

Source: APPA.

U.S. PULP & PAPER INDUSTRY Number of Companies and Mills

	Co's	—Mills— Paper	Pulp
1946	517	735	242
1947	560	758	241
1948	570	768	245
1949	565	764	255
1950	572	767	259
1951	530	769	278
1952	490	768	303
1953	483	772	299
1954	482	775	319
1955	495	788	326
1956	493	804	330
1957	494	795	338
1958	495	815	347
1959	496	816	365
1960	479	814	264

NATIONAL INCOME BY INDUSTRY

Year	Industries (millions of dollars)	M'facturing	Paper and Allied Products
1930	75,729	18,232	504
1935	57,057	13,265	461
1940	81,634	22,336	665
1945	181,248	52,008	1,341
1950	241,876	74,371	2,683
1952	292,155	90,172	3,120
1954	301,794	91,057	3,351
1955	330,206	104,490	3,725
1956	350,836	109,268	4,186
1957	366,943	112,476	4,016
1958	367,686	104,125	3,952
1959	399,648	119,400	4,452

Source: APPA.

U.S. BUILDING BOARD PRODUCTION

Year	Hard-board (over 26 lb. density)	Insulating board (under 26 lbs. density)	Total Tons
1941	254,477	362,033	616,510
1950	381,201	838,367	1,220,000
1952	435,154	879,655	1,314,809
1954	464,868	1,007,653	1,472,521
1955	529,558	1,092,890	1,622,448
1956	539,981	1,102,012	1,641,993
1957	568,522	989,059	1,557,581
1958	615,000	1,031,000	1,646,000
1959	734,000	1,173,000	1,907,000
1960	740,000	1,042,000	1,782,000

Source: U.S. Dept. of Commerce.

U.S. WEEKLY EARNINGS— PAPER AND ALLIED PRODUCTS

Year	No. of Production Workers (In Thous.)	(For Production Workers Only) Ave. Weekly Earnings	Ave. Weekly Hours	Ave. Hourly Earnings
1947	406	$50.21	43.1	$1.16
1948	407	$55.25	42.8	$1.29
1949	389	$55.96	41.0	$1.34
1950	415	$61.14	43.3	$1.41
1951	434	$65.51	43.1	$1.52
1952	422	$68.91	42.8	$1.61
1953	444	$72.90	43.0	$1.69
1954	440	$74.01	42.3	$1.75
1955	453	$78.87	43.1	$1.83
1956	463	$83.03	42.8	$1.94
1957	459	$86.29	42.3	$2.04
1958	439	$88.83	41.9	$2.12
1959	449	$94.16	42.8	$2.20
1960	448	$96.22	42.2	$2.28

Source: U.S. Bureau of Labor Statistics

U.S. BOARD PRODUCTION

(In Thousands of Tons)

	Paper-board*	Wet Machine Board**	Building Board
1946	8,396	138	956
1949	8,992	125	839
1950	10,926	165	1,221
1952	10,772	140	1,309
1954	12,191	136	1,473
1956	14,234	147	1,642
1957	14,062	137	1,558
1958	14,151	131	1,665
1959	15,456	150	1,807
1960	15,634	149	1,782

**Container boards, box boards, cardboard and other.*
***Shoe board, binder board and other.*
Source: U. S. Department of Commerce

HOURS AND EARNINGS DATA

Paper and Allied Products Industry

Year	Average Hourly Earnings	Average Weekly Earnings	Average Weekly Hours
Paper and Allied Products			
1955	$1.830	$78.69	43.0
1956	1.940	83.03	42.8
1957	2.040	86.29	42.3
1958	2.120	88.83	41.9
1959	2.200	94.16	42.8
1960	2.280	96.22	42.2
Pulp, Paper and Paperboard Mills			
1955	1.940	85.94	44.3
1956	2.060	91.05	44.2
1957	2.170	94.18	43.4
1958	2.240	96.10	42.9
1959	2.340	102.73	43.9
1960	2.420	105.03	43.4
Paperboard Containers and Boxes			
1955	1.750	73.85	42.2
1956	1.830	76.13	41.6
1957	1.930	79.90	41.4
1958	2.010	82.41	41.0
1959	2.100	87.78	41.8
1960	2.160	88.13	40.8
Other Paper and Allied Products			
1955	1.690	69.97	41.4
1956	1.770	72.92	41.2
1957	1.860	76.07	40.9
1958	1.940	78.96	40.7
1959	2.010	83.42	41.5
1960	2.080	85.28	41.0

U.S.A. PAPERBOARD PRODUCTION AND CAPACITY—1925-1960

(in short tons of 2,000 lbs.) By National Paperboard Assn.

Year	Capacity	Total Production	CONTAINERBOARD-DOMESTIC USE				BOXBOARD-DOMESTIC USE				All Other Paperboard
			Total	Liners	Corrugating Materials	Chip and Filler Boards	Total	Folding	Set-Up	Special Food Board	
1925	4,807,700	3,125,000	1,470,900	782,800	281,000	407,100	1,347,800	707,900	639,900	(a)	306,300
Avg '26-'29	5,471,875	3,754,650	1,781,750	960,800	353,600	467,350	1,467,100	848,900	618,200		505,800
1930	5,995,600	3,957,100	1,875,600	1,087,300	385,600	402,700	1,530,700	928,800	601,900		550,800
1931	5,943,800	3,804,000	1,815,000	1,071,900	383,800	359,300	1,475,600	921,000	554,600		513,400
1932	6,036,000	3,319,800	1,619,600	965,600	373,000	281,000	1,268,600	788,700	479,900		431,600
1933	6,252,100	3,938,800	1,978,900	1,214,500	459,800	304,600	1,446,900	895,300	551,600		513,000
1934	6,496,100	3,962,600	1,986,100	1,227,900	483,000	275,200	1,443,900	937,900	506,000		532,600
1935	6,798,500	4,555,000	2,309,000	1,440,800	587,200	281,000	1,578,200	1,047,100	531,100		667,800
1936	7,211,800	5,336,700	2,738,200	1,704,800	698,700	334,700	1,799,900	1,212,200	587,700		798,600
1937	7,309,900	5,555,500	2,880,500	1,800,000	737,500	343,000	1,807,800	1,237,800	570,000		867,200
1938	7,839,200	4,938,700	2,479,800	1,552,000	673,500	254,300	1,681,200	1,162,400	518,800		777,700
1939	7,834,100	5,953,900	3,000,300	1,877,900	837,900	284,500	1,970,700	1,385,000	585,700		982,900
Avg '30-'39	6,771,710	4,532,210	2,268,300	1,394,270	562,000	312,030	1,600,350	1,051,620	548,730		663,560
1940	8,007,700	6,326,100	3,147,600	1,965,900	903,400	278,300	2,026,300	1,413,100	613,200		1,152,200
1941	8,588,900	7,901,800	4,044,400	2,560,900	1,132,600	350,900	2,480,800	1,749,300	731,500		1,376,600
1942	8,528,200	7,163,700	3,607,300	2,272,200	932,100	403,000	2,381,400	1,440,500	615,900	325,000	1,175,000
1943	8,238,900	7,662,200	3,939,300	2,493,100	1,029,700	416,500	2,597,000	1,612,700	599,000	385,300	1,125,900
1944	8,561,200	7,961,900	4,123,100	2,598,200	1,089,900	435,000	2,590,300	1,660,700	543,100	386,500	1,248,500
1945	8,535,700	7,938,200	4,099,800	2,590,800	1,111,500	397,500	2,633,800	1,722,200	511,600	400,000	1,204,600
1946	8,846,300	8,492,400	4,313,700	2,721,800	1,263,100	328,800	3,028,700	2,109,000	474,100	445,600	1,150,000
1947	9,455,500	9,360,900	4,888,400	3,137,600	1,420,300	330,500	3,158,800	2,096,500	601,500	460,800	1,313,700
1948	10,092,800	9,588,200	4,960,300	3,251,600	1,387,300	321,400	3,149,300	2,066,400	639,500	443,400	1,478,600
1949	11,096,000	9,209,700	4,623,100	3,004,100	1,349,200	269,800	3,188,200	2,010,100	662,500	515,600	1,398,400
Avg '40-'49	8,995,120	8,160,510	4,174,700	2,659,620	1,161,910	353,170	2,723,460	1,788,050	599,190	420,275(b)	1,262,350
1950	11,861,200	11,149,500	5,692,600	3,709,000	1,670,000	313,600	3,792,900	2,358,100	729,800	705,000	1,664,000
1951	12,650,200	11,891,200	6,207,900	4,043,900	1,806,000	358,000	3,834,300	2,341,800	681,900	810,600	1,849,000
1952	12,999,400	11,049,500	5,637,600	3,682,800	1,625,800	329,000	3,656,500	2,186,400	635,300	834,800	1,755,400
1953	13,488,400	12,544,200	6,440,400	4,209,200	1,896,500	334,700	4,026,600	2,382,500	680,300	963,800	2,077,200
1954	13,961,400	12,286,000	6,234,200	4,105,700	1,876,700	251,800	4,010,000	2,396,900	611,000	1,002,100	2,041,800
Avg '50-'54	12,992,120	11,784,080	6,042,540	3,950,120	1,775,000	317,420	3,864,060	2,333,140	667,660	863,260	1,877,480
1955	14,628,900	14,043,700	7,244,200	4,789,600	2,165,400	289,200	4,407,400	2,625,900	636,700	1,144,800	2,392,100
1956	15,288,900	14,371,600	7,451,300	4,933,400	2,249,500	268,400	4,530,300	2,629,700	636,700	1,263,900	2,390,000
1957	15,763,000	14,186,700	7,343,800	4,876,300	2,215,600	251,900	4,518,600	2,707,700	568,200	1,242,700	2,324,300
1958	16,530,300	14,216,100	7,236,900	4,818,600	2,169,300	249,000	4,542,800	2,697,600	538,600	1,306,600	2,436,400
1959	17,345,400	15,957,800	8,217,000	5,485,500	2,473,700	257,800	4,915,400	2,883,000	586,700	1,445,700	2,825,400*
1960	17,898,900	15,930,000	8,178,200	5,462,000	2,465,300	250,900	4,906,100	2,925,800	529,200	1,451,100	2,845,700*

	1959	1960
* Containerboard Type	1,373,700	1,385,300
Boxboard Type	1,451,700	1,460,400

NORTH AMERICA

Canada

Pulp and paper production exceeded all previous records despite general business slowdown and rising costs

Population: 18,000,000. Per capita paper consumption: 280 lbs.
Paper mills: 95; woodpulp (only) mills: 39; other fiber pulp mills: 2

PRODUCTION (short tons)	1959	1960
Paper and paperboard	8,584,470	8,617,267
Newsprint	6,394,172	6,738,611
Chemical woodpulp	4,995,375	5,314,108
Mechanical woodpulp	5,584,612	5,795,463
Total woodpulp	10,643,281	11,182,907
IMPORTS-EXPORTS	**1959**	**1960**
Woodpulp exports	2,460,133	2,605,799

Principal grades made: Newsprint, kraft and sulfite papers, book, fine, board

By CHARLES L. SHAW
Canadian Editorial Director

—Montreal

IN A YEAR when the Canadian economy as a whole was moving slowly in the face of a general business slowdown and widespread unemployment, the pulp and paper industry gave good account of itself. The year 1960 was anything but a boom period, and demand and prices of some of the industry's products gave no cause for jubilation; but pulp and paper operations from Vancouver Island to Newfoundland continued active, and here and there impressive expansion was under way.

During the past year, the total production of the Canadian industry exceeded all previous records. Domestic and export shipments increased, and overall output exceeded 1959 by 5%. While most sections of the industry operated at somewhat less than capacity, operating rates were higher than in the year before.

Eighty percent of Canada's total pulp-paper output is exported, with the U.S. the dominant customer. Decline in the value of the Canadian dollar in relation to U.S. currency was a favorable factor.

For all its comparative prosperity, the industry continued to be beset by problems. One, not a new development, is rising costs of production and growing competition with countries whose costs are relatively much lower. Several producing areas of Canada continue to be handicapped by their distance from major consuming centers—a factor that not only emphasizes the need for greater automation, integration and fuller use of raw material but places more and more stress on product research and aggressive marketing.

As the world grows smaller politically, Canada is facing a new set of conditions. Pulp and paper men in Canada are studying the development of trading blocs overseas with considerable anxiety. The European Common Market and the European Free Trade Area poses problems for them, they say, and they fear that the extent of the United Kingdom's involvement in either or both of these blocs could have serious repercussions, such as the elimination of preferential tariffs that have significantly stimulated sales in the British market. Newsprint and paper may continue to get favorable tariff treatment regardless.

These developments point up the keener interest that the industry must take in international politics, say Canadian leaders, and several Canadian companies have established their own offices overseas as listening posts as well as sales outlets.

In recent months there has been concern in Canada over the extent of foreign investments —mostly American capital—in pulp and paper and other Canadian resource industries, but much of this has evaporated with the realization that money from outside, especially from the U.S.A., has been primarily responsible for Canada's expansion during the past decade.

In a recent address before the Empire Club in Toronto, Robert M. Fowler, president of the Canadian Pulp & Paper Association and the Newsprint Association of Canada, described as "childish and churlish" a tendency to blame the U.S. for Canada's economic troubles. Referring to private investment of U.S. capital in Canada, Mr. Fowler said, "If we are not careful we may find that foreign investment will turn to other more agreeable and enticing places. If this happens, we will wake up to find that our growth has been sharply and shockingly arrested."

It is true that the pace of Canadian industry for some time has been noticeably slower than in the '50's. "The plain fact is that growth in the Canadian economy has almost disappeared during the past four years," says Mr. Fowler. "We need to get away from emotional generalities and get down to specifics and action."

One specific is the levelling of the Canadian dollar to par with the U.S., which seems to be approaching. Another is revision of the tax structure to relate to new economic conditions.

Total Canadian production of pulp and paper this year may not exceed the record of 1960, but the industry is charged with confidence, based in part on business recovery in the U.S. and a wider spread of prosperity overseas, even though some of the overseas markets may offer special marketing problems.

Canada's Largest Paper Cos. With Newsprint Capacities

	Rated capacity 1961 (Tons)
Abitibi Power & Paper Co.	952,649
Canadian International Paper Co.	936,478
Consolidated Paper Corp.	854,995
MacMillan, Bloedel & Powell River	791,532
Price Bros.	505,629
Bowaters (Canada)	467,601
St. Lawrence Corp.	437,408
The Ontario Paper Co.	391,425
Great Lakes Paper Co.	357 348
Ontario-Minnesota	295,334
Crown Zellerbach Canada	294,250

EXPANSION THROUGHOUT CANADIAN INDUSTRY is represented by Rayonier Canada's rayon pulp mill at Woodfibre, B.C., converted into 250-ton kraft mill (left) and installation of new Dominion-Beloit paper machine (No. 4) at Canadian International Paper Co., LaTuque, Que. (right).

Canadian newsprint production in 1960 was about 5% higher than in 1959 and set a new record, about 4% higher than in the previous high year, 1956. The increase was the largest shown in any of the past 13 years and was more than the modest volume of new productive capacity which became available in Canada during 1960. As a result, newsprint operating ratios averaged about 88.5% compared with 85% of a smaller capacity in 1959, the amount of stand-by or reserve capacity being reduced correspondingly. The U.S. absorbed about 78% of total newsprint production, Canada 7%; all other markets 15%.

Canadian newsprint shipments overseas were almost 30% higher than in 1959, with increases to the United Kingdom, Australasia and South America being particularly large.

A 5% gain in woodpulp production in 1960 was registered by the Canadian industry, owing primarily to increased output of paper and paperboard; also to a pronounced advance in pulp exports, especially to the United Kingdom, West Germany and France. The industry produced about 11,300,000 tons of woodpulp in 1960, compared with 10,800,000 tons in 1959, and of that amount 77% was used in Canada in the processing of newsprint, paperboard and fine, specialty and wrapping papers. The balance, about 23%, was exported.

A new record, for the third successive year, was scored by paperboard, up 5%. Increased shipments of container grades more than offset a levelling off in boxboard grades. Because

Major Expansion in Canada

List of principal new projects carried out during the past few months, already under way or scheduled pretty definitely for an early start:

British Columbia: **Celgar's** new 500-ton bleached kraft mill now in production. Cost $42,000,000.

Rayonier Canada's rayon pulp mill at Woodfibre converted into 250-ton kraft mill, completed this summer. Cost $15,000,000.

MacMillan, Bloedel & Powell River installing third newsprint machine at Port Alberni (410 tons), to be ready in 1963. Cost: $24,000,000.

British Columbia Forest Products, Ltd., building 350-ton newsprint machine, to be ready in 1964. Cost: $25,000,000.

Alberta: **Albertawest Forest Products** expected to start construction this year of 300-ton newsprint mill at Whitecourt. Cost: $35,000,000.

Ontario: **Great Lakes Paper Co.** at Fort William carrying out extensive improvements, to be completed this summer. Cost: $3,250,000.

Quebec: **The E. B. Eddy Co.** continuing program of modernization at Hull. Estimated cost: $2,400,000.

Gulf Pulp & Paper Co. at Clarke City installing Kamyr machines and other facilities. Cost: $2,500,000.

Price Bros. & Co. plans to provide new paperboard machine and 200-ton kraft mill at Kenogami, to be completed within two years. Cost: $22,000,000.

Gaspesia Sulphite Co. at Chandler is undertaking installation of new paper machine and other extensions. Cost: $17,000,000.

Canadian International Paper Co. recently started up its new paperboard machine at LaTuque. Cost: $12,000,000.

Nova Scotia: **Nova Scotia Pulp, Ltd.,** backed by Stora Kopparberg and Scott Paper Co., at Port Hawkesbury, plans to have its new 350-ton bleached sulfite mill in full production early in 1962.

Thurso Pulp & Paper Co. has doubled capacity of its bleached kraft pulp mill capacity to 350 tons. Cost: $4,000,000.

Bowater's Mersey Paper Co. carrying out improvements costing about $4,600,000.

New Brunswick: **Sogemines, Ltd.** plans to start construction of newsprint mill at St. John this summer, to be operated by Rothesay Paper Corp.

Newfoundland: **Bowater's Newfoundland Pulp & Paper Mills** completing new installations. Cost: $5,000,000.

Anglo-Newfoundland Development Co. speeding up newsprint machines. Cost: $2,000,000.

Several new mills are contemplated in the Maritimes and one in Newfoundland, as well as on the prairies and in British Columbia, but none has reached the definite stage. Probably the most likely enterprises to be proceeded with in the early future are three in B.C.—on Vancouver Island (2) and in the interior, probably near Prince George.

of tariffs, Canada's exports of paperboard have been modest and last year accounted for only about 11% of the production, but in tons there was a sharp increase of almost 50% over 1959, largely in shipments of linerboard and corrugating board to Britain. Production of fine paper rose 5% to a new high, Wrapping paper, on the other hand, was off, due to a continuing trend toward bulk shipment of products, and decline in the building trades.

The industry, through its Pulp & Paper Research Institute and various company research departments, is carrying out a consistent technological program with a view to developing more efficient processes of manufacture, and in the woods the tendency toward greater mechanization was more conspicuous than ever, especially in eastern Canada. West of the Rockies, mechanical logging has made faster strides because of the necessity to develop techniques to deal with bigger timber in rougher terrain, but now it is becoming standard procedure in the eastern provinces where, only a few years ago, the power saw was virtually unknown and the horse-drawn sleigh was doing the job now performed faster and more effectively by tractor and truck.

Studies are now in progress on improved methods of forming paper on the machine, and the institute is examining every type of physical and chemical damage which the cellulose fiber experiences under present practices of mechanical and chemical pulping. In British Columbia, efforts are under way to make wider use of cedar in pulping processes, this species being virtually rejected in the past because of color and other disadvantages although it is abundant in the West Coast forests.

One of the issues facing the industry this year has been the seven-day work week in the newsprint mills. Newfoundland and B.C. have been the only provinces where the seven-day week prevails. Operators in other provinces hope to get it, claiming that it would add about 750,000 tons to annual capacity without costly capital investment.

ROUNDUP OF CANADIAN STATISTICS—1959-1960

	Production		*Exports*	
	1960	*1959*	*1960*	*1959*
Gross value of output	$1.5 billion	$1.4 billion	$1.1 billion	$1.073 billion
	Short tons	Short tons	Short tons	Short tons
Total wood pulp	11,182,907	10,643,281	2,605,799	2,460,133
Dissolving & spec. chemical	323,162	363,569	274,664	308,785
Bleached sulfite	647,135	539,651	420,775	333,061
Unbleached sulfite	1,658,125	1,574,404	168,710	185,032
Bleached sulfate	1,429,431	1,309,238	1,108,482	1,036,061
Unbleached sulfate	992,554	958,480	344,053	313,335
Other chemical	273,701	250,033	43,250	39,292
Groundwood	5,795,463	5,584,612	234,833	238,105
Newsprint	6,738,611	6,394,172	6,265,299	5,952,704
Containerboard	564,142	520,045	95,840	59,885
Boxboard	425,164	433,335	10,044	16,674
Total paperboard	989,306	953,380	105,884	76,559
Fine paper	289,189	277,730	21,785	17,834
Coated paper	34,681	33,467	1,341	1,191
Other printing paper	117,834	103,521	91,081	71,609
Special papers	141,434	132,300	6,340	3,919
Wrapping paper	306,212	318,849	30,795	40,907

These figures cover only those reported to the Canadian Pulp & Paper Association. They account for more than 98% of the industry's output. They do not include defibrated and exploded pulps and a small tonnage of some papers and boards. There are also some slight duplications in the figures. Some paperboard and wrapping paper is used by the mills for packaging. Coated paper covers a tonnage that undergoes a further processing after it leaves the paper machine and thus is also included under other grades. Total woodpulp production includes screenings. In addition to woodpulp, the industry uses annually in the manufacture of paper some 490,000 tons of waste paper, straw, rags, and other fibers.

CANADA: Capacity of INDIVIDUAL NEWSPRINT MILLS

	No. of Mills	*Machines*	*Rated Capacity 1960*	*1961*
Abitibi Power & Paper Co. Ltd.	6	20	958,860	952,649
Beaupre, Que.			131,657	131,416
Fort William, Ont.			166,242	165,166
Iroquois Falls, Ont.			276,246	276,914
Pine Falls, Man.			147,702	146,746
Port Arthur, Ont.			137,515	136,623
Sault Ste. Marie, Ont.			99,498	95,784
*Anglo-Canadian Pulp & Paper Mills	1	4	277,497	284,896
*Anglo-Newfoundland Dev. Co.	1	7	241,896	284,040
*Beaver Wood Fibre Co. Ltd.	1	1	35,226	35,919
*Bowaters Corp. of North America	2	8	468,789	467,601
B. Mersey Paper Co., Liverpool, N. S.			145,848	144,904
B. Newfoundland Pulp & Paper Mills, Corner Brook, Nfld.			322,941	322,697
*Canadian International Paper Co.	3	16	938,124	936,478
Dalhousie, N. B.			281,808	280,592
Gatineau, Que			316,416	317,208
Three Rivers, Que.			339,900	338,678
Consolidated Paper Corp. Ltd.	5	24	857,475	854,995
Cap de la Madeleine, Que.			109,077	108,371
Grand'Mere, Que.			161,298	162,096
Port Alfred, Que.			246,891	245,293
Shawinigan Falls, Que.			259,869	258,494
Three Rivers, Que.			80,340	80,741
*Crown Zellerbach Canada	2	4	265,289	294,250
Elk Falls, B. C.			162,083	188,149
Ocean Falls, B. C.			103,206	106,101
Donohue Brothers Ltd.	1	3	108,500	109,457
The E. B. Eddy Co.	1	1	54,760	56,669
Great Lakes Paper Co. Ltd.	1	4	359,676	357,348
Howard Smith Paper Mills Ltd.	1	3	125,240	127,542
James Maclaren Co. Ltd.	1	2	126,072	126,484
MacMillan, Bloedel & Powell River Ltd.	2	11	731,196	791,532
Port Alberni, B. C.			213,850	249,662
Powell River, B. C.			517,346	541,870
*Ontario Paper Co. Ltd.	2	7	389,031	391,425
Baie Comeau, Que.			177,984	178,674
Thorold, Ont.			211,047	212,751
*Ontario-Minnesota Pulp & Paper	2	5	292,623	295,334
Fort Frances, Ont.			76,014	78,899
Kenora, Ont.			216,609	216,435
Price Brothers & Co. Ltd.	2	11	507,996	505,629
Kenogami, Que.			271,611	270,160
Riverbend, Que.			236,385	235,469
Richmond Pulp & Paper Co.	1	3	117,236	119,244
St. Lawrence Corp. Ltd.	3	9	439,022	437,408
Dolbeau, Que.			136,269	135,387
Red Rock, Ont.			62,351	61,947
Three Rivers, Que.			240,402	240,074
St. Raymond Paper Ltd.	1	1	27,501	27,323
*Spruce Falls Power & Paper	1	4	277,173	277,835
Total	40	148	7,611,194	7,734,058

* Wholly or partly owned in U.S.A. or Britain.

PRINCIPAL STATISTICS OF CANADIAN PULP AND PAPER INDUSTRY

Year	Establishments	Capital	Employes	Salaries and Wages	Fuel and electricity purchased	Materials and supplies used	Gross Value of products
	No.	$	No.	$	$	$	$
1919	99	275,767,364	26,647	32,264,208	12,503,197	54,084,801	137,912,502
1925	114	460,397,772	28,031	38,560,905	17,506,735	76,514,990	193,092,937
1931	103	630,176,540	26,669	34,792,013	22,927,919	63,947,678	174,733,954
1937	98	570,352,287	33,205	48,757,795	29,121,065	91,121,629	226,244,711
1943	106	667,458,143	37,020	71,199,422	36,211,064	143,956,462	345,653,470
1949	123	1,100,000,000	52,050	157,703,868	41,370,633	272,681,606	836,148,393
1950	124	1,150,000,000	52,343	169,246,531	44,440,376	289,548,301	954,137,651
1951	126	1,200,000,000	57,291	213,169,906	75,625,718	421,280,139	1,237,897,470
1952	128	1,872,114,000	57,803	225,353,327	76,739,757	497,046,828	1,157,887,657
1953	127	2,110,262,000	58,194	235,741,660	80,379,515	499,350,994	1,179,934,934
1954	127	2,590,923,000	60,837	252,598,383	84,880,788	515,257,595	1,241,558,451
1955	128	2,684,000,000	62,500	262,598,000	91,040,773	546,079,000	1,326,938,138
1956	130	3,021,600,000	65,985	297,571,944	103,505,892	560,449,000	1,465,057,725
1957	132	3,233,800,000	65,940	307,627,849	108,636,965	617,175,797	1,411,934,462
1958	128	3,336,000,000	64,084	307,415,615	105,796,875	597,804,877	1,406,522,541
1959*	128	3,500,000,000	65,000	310,500,000	107,500,000	600,000,000	1,500,000,000

*Estimated

CANADIAN PAPER PRODUCTION

	Newsprint		Total Paper	
	Tons	$ Value	Tons	$ Value
1917	689,847	38,868,084	853,689	58,750,341
1929	2,725,331	150,800,157	3,197,149	192,989,252
1932	1,919,205	85,539,852	2,299,767	114,115,570
1945	3,324,039	189,023,736	4,359,576	282,837,614
1948	4,640,336	402,099,178	6,063,646	582,346,000
1950	5,318,988	506,968,207	6,812,035	710,153,826
1952	5,687,051	600,515,000	7,201,800	838,105,108
1954	6,000,895	657,487,344	7,649,607	925,590,643
1956	6,445,110	735,644,099	8,466,785	1,070,355,000
1957	6,396,501	729,009,081	8,299,889	1,056,371,332
1958	6,095,553	699,906,388	8,271,197	1,000,000,000
1959	6,394,172	735,000,000	8,584,470	1,103,250,000
1960	6,738,611	*750,000,000	*8,800,000	*1,150,000,000

*Estimates by PULP & PAPER
Source: Dominion Bureau of Statistics.

CANADIAN PULPWOOD

(In cords. All quantities given in terms of rough or unpeeled wood)

	Production	Consumption	Exports	Imports
1925	5,092,461	3,668,959	1,423,502	
1930	5,977,183	4,741,349	1,330,466	94,632
1935	6,095,016	5,005,083	1,109,873	19,940
1940	8,716,541	7,110,754	1,551,600	47,626
1945	10,973,094	7,659,899	1,684,421	4,133
1949	10,308,776	10,470,481	1,644,253	5,491
1950	13,424,353	11,434,908	1,782,134	28,220
1951	18,156,282	12,634,426	2,893,615	46,634
1952	14,755,082	11,991,074	2,529,353	31,060
1953	13,545,176	12,109,658	1,783,657	48,805
1954	14,739,565	12,981,000	1,826,193	105,030
1955	16,087,953	13,629,413	1,882,784	134,917
1956	17,556,265	14,031,855	1,953,470	188,144
1957	14,967,600	13,187,474	1,800,411	179,614
1958	12,732,364	12,477,330	1,286,214	146,835
1959	14,555,542	13,730,820	1,107,484	147,766

Source: Dominion Bureau of Statistics.

CANADIAN PULP AND PAPER PAYROLL DATA

	Total Employes	Employes On Salary	Average Salary	Employes On Wages	Average *Wage	Total Salaries-Wages
1920	31,298	2,669	$2,449	28,629	$1,352	$ 45,253,893
1939	31,016	4,382	$2,482	26,634	$1,271	$ 44,737,739
1947	49,946	7,706	$3,411	42,240	$2,443	$129,477,995
1950	52,343	8,578	$4,163	43,765	$3,051	$169,246,531
1953	58,194	9,394	$5,315	48,800	$3,808	$235,741,660
1954	60,837	9,689	$5,500	50,309	$4,000	$252,598,383
1955	62,205	9,933	$5,636	52,272	$4,004	$262,600,000
1956	65,985	10,867	$5,896	55,118	$4,264	$300,000,000
1957	65,940	11,495	$6,121	55,445	$4,356	$307,627,849
1958	64,084	11,594	$6,404	52,490	$4,442	$307,415,615
1959	65,028	11,702	$6,624	53,326	$4,591	$322,311,304

* Woods labor not included.
Source: Dominion Bureau of Statistics.

CANADIAN NEWSPRINT CAPACITY

(In thousands of short tons)

	Rated Capacity	Idle Capacity	Operating %
1925	1,715	193	88.8
1930	3,600	1,096	69.6
1935	3,914	1,163	70.3
1940	4,368	949	78.3
1945	4,301	1,042	75.8
1949	5,113	nil	101.2
1951	5,360	nil	100.7
1953	5,723	nil	100.
1955	6,190	nil	—
1956	6,242	nil	103.6
1957	6,756	nil	94.7
1958	7,239	nil	82.9
1959	7,521	nil	85.0
1960	7,611	—	88.5
1961	7,734	—	—

Source: Newsprint Association of Canada.

CANADA—PULP PRODUCTION

(Tons of 2,000 lbs.)

	Mechanical Tons	Sulfite Tons	Alkaline Tons	Total Tons
1920	1,090,114	654,273	188,487	1,922,774
1925	1,621,917	842,785	242,207	2,706,909
1930	2,283,130	1,076,804	188,253	3,548,187
1935	2,458,000	1,025,000	206,000	3,689,000
1940	3,305,484	1,480,545	399,267	5,290,762
1945	3,341,920	1,639,684	478,740	5,460,344
1950	4,910,803	2,110,773	1,053,588	8,075,164
1953	5,122,537	2,398,543	1,440,517	8,961,597
1955	5,429,162	2,795,720	1,642,356	9,867,238
1957	5,516,713	2,237,462	2,421,532	10,176,707
1958	5,323,946	2,418,709	2,253,328	9,995,983
1959	5,584,612	2,114,055	2,267,718	10,639,529
1960	5,795,463	2,305,260	3,182,184	11,282,887

Source: *Canadian Pulp and Paper Association*
*Preliminary

CANADA'S PULP EXPORTS

	Tons	Value
1921	527,222	$33,133,675
1926	1,003,081	52,077,122
1932	452,292	18,930,065
1937	870,711	41,815,731
1942	1,510,727	95,266,873
1947	1,698,712	177,802,612
1951	2,260,834	365,132,884
1953	1,950,152	248,674,880
1955	2,366,133	297,304,069
1956	2,374,013	304,526,497
1957	2,232,185	292,406,102
1958	2,213,701	285,203,526
1959	2,450,027	311,252,798
1960	2,605,799	*320,000,000

*Estimated
Source: Canadian Dominion Bureau of Statistics and Canadian Pulp and Paper Association.

MILL LOCATIONS

	Pulp Mills	Pulp & Paper Mills	Paper Mills	Total
Alberta	1	1	..	2
Newfoundland	..	2	..	2
Nova Scotia	1	2	..	3
New Brunswick	4	3	..	7
Quebec	12	34	9	55
Ontario	6	20	15	41
Saskatchewan	..	1	..	1
Manitoba	..	3	..	3
British Columbia	6	8	..	14
Canada	30	74	24	128

Source: Dominion Bureau of Statistics.

FOREST CONSUMPTION

Average Annual Depletion 1949-58

Products Utilized	Thousands of cu. ft.	% Utilized	% Depleted
Logs and bolts for domestic use	1,473,782	47.0	43.1
Logs and bolts for export	8,787	0.3	0.3
Pulpwood for domestic use	1,078,071	34.4	31.5
Pulpwood for export	164,749	5.3	4.8
Fuelwood	337,523	10.8	9.9
Ties, poles, pitprops, rails	51,761	1.6	1.5
Miscellaneous	17,509	0.6	0.5
	3,132,182	100.0	91.6
Loss by fire	288,027		8.4
	3,420,209		100.0

(Figure for depletion does not include agencies other than fire)

Source: Dominion Bureau of Statistics and Department of Forestry

CONIFEROUS STANDS

Estimated Stands of Accessible Conifers by Provinces

	Millions of cu. ft.	Pulpwood Production Rough Cord Basis—1960
Newfoundland	13,281	1,045,991
Prince Edward Island	99	43,859
Nova Scotia	6,469	262,772
New Brunswick	11,947	1,410,458
Quebec	42,732	6,623,071
Ontario	51,167	3,998,144
Manitoba	5,825	220,901
Saskatchewan	6,191	40,115
Alberta	29,023	382,344
British Columbia	301,874	2,335,209
Yukon Territory	2,567	——
Northwest Territories	3,460	——
	474,635	16,362,864

Source: Economics Division, Department of Forestry and Dominion Bureau of Statistics

FOREST HOLDINGS—1960

(net area, excluding rivers and lakes)

	Sq. Miles	Percent
Occupied forest lands:		
Provincial Crown:		
Leases and licenses	187,746	18.8
Permits and sales	4,361	0.4
	192,107	19.2
Federal Crown:		
Leases and licenses	311	0.0
Other lands	3,729	0.4
	4,040	0.4
Privately-owned:		
Farm woodlots	35,172	3.5
Other	55,680	5.6
	90,852	9.1
Total occupied forest lands:	286,999	28.7
Unoccupied forest lands:		
Provincial Crown	628,818	62.9
Federal Crown	84,432	8.4
Total unoccupied forest lands:	713,250	71.3

Source: Economics Division, Division of Forestry

CANADIAN FORESTS—1960

	Sq. Miles
Forested areas (All except 275,800 sq. mi. lies within the ten provinces)	1,711,893
Forested areas classed as unproductive (small trees in adverse locations not expected to reach merchantable size)	711,644
Productive forest areas	1,000,249
Potentially accessible productive forests	274,261
Accessible production forests (about half bears trees classified as merchantable—4 in. dbh and over; remainder is young growth)	725,988

Source: Economics Division, Department of Forestry

CANADIAN WOODPULP STATISTICS—1959

(in short tons)

	Production	Imports	Exports	Consumption	Apparent Supply
Groundwood	5,655,701	105	235,445	5,397,872	22,489
Sulfite, paper grades	2,129,589	38,850	603,905*	1,685,282	—120,748
Sulfate, paper grades	2,234,039	17,060	1,466,239	888,685	—103,825
Dissolving and special alpha	390,836	7,889	242,001	4,822	151,902
Screenings and others	422,035	—	53,868	390,482	— 22,315
Total	10,832,200	63,904	2,601,458	8,367,143	— 72,497

* Includes dissolving and special alpha

Source: Dominion Bureau of Statistics

CANADIAN PAPER PRODUCTION BY PROVINCES

(Quantity in Tons—Value in Dollars)

	Quebec	Ontario	British Columbia	Other Provinces	Total
1945 Tons	2,292,442	1,267,796	334,502	464,836	4,359,576
1945 Value	$148,180,691	$86,395,223	$20,353,984	$27,907,716	$282,837,614
1951 Tons	3,511,669	2,019,235	513,165	1,181,202	7,225,271
1951 Value	$389,554,493	$251,918,611	$59,763,061	$122,793,484	$824,029,649
1953 Tons	3,542,987	2,018,843	632,556	1,182,140	7,376,526
1953 Value	$416,505,144	$263,409,878	$74,131,677	$133,811,774	$887,858,473
1955 Tons	3,789,087	2,225,109	725,096	1,260,921	8,001,213
1955 Value	$453,543,730	$298,099,787	$86,193,930	$143,601,800	$981,439,247
1957 Tons	4,100,000	2,275,000	740,000	1,184,889	8,299,889
1957 Value	$500,000,000	$320,000,000	$88,000,000	$148,371,322	$1,056,371,322
1958 Tons	3,688,185	2,355,221	828,864	1,209,023	8,081,293
1958 Value	$467,118,921	$329,282,955	$100,724,925	$147,513,399	$1,044,640,200
1959 Tons	3,818,861	2,430,913	1,048,432	1,251,653	8,549,859
1959 Value	$485,337,000	$342,043,000	$126,165,000	$152,526,000	$1,106,071,000

Source: Dominion Bureau of Statistics

CANADIAN WOODPULP PRODUCTION BY PROVINCES

(Quantity in Tons—Value in Dollars)

	Quebec	Ontario	British Columbia	Other Provinces	Total
1945 Tons	2,887,176	1,468,682	520,571	724,385	5,600,841
1945 Value	$114,197,036	$62,596,260	$21,998,381	$33,081,445	$231,873,122
1950 Tons	3,922,543	2,297,518	776,896	1,476,067	8,147,014
1950 Value	$216,299,900	$156,390,753	$49,381,923	$80,511,349	$502,583,925
1952 Tons	4,192,047	2,308,722	915,634	1,552,606	8,968,009
1952 Value	$280,314,341	$182,773,000	$82,551,730	$104,382,109	$650,021,180
1955 Tons	4,491,139	2,602,298	1,363,761	1,693,340	10,150,547
1955 Value	$280,171,743	$196,235,632	$107,637,777	$109,357,679	$693,402,831
1956 Tons	4,809,011	2,735,241	1,423,943	1,765,579	10,733,744
1956 Value	$296,884,619	$178,012,929	$120,495,242	$110,839,744	$706,232,524
1957 Tons	4,605,850	2,746,177	1,375,848	1,697,417	10,425,295
1957 Value	$287,727,250	$207,305,585	$97,155,404	$115,006,410	$706,194,649
1958 Tons	4,223,227	2,736,456	1,453,854	1,723,917	10,137,454
1958 Value	$256,238,044	$217,476,915	$103,849,925	$125,800,710	$703,365,594
1959 Tons	4,374,156	2,758,176	1,926,672	1,733,196	10,832,200

Source: *Dominion Bureau of Statistics*

NEWSPRINT EXPORTS FROM CANADA

(Short Tons)

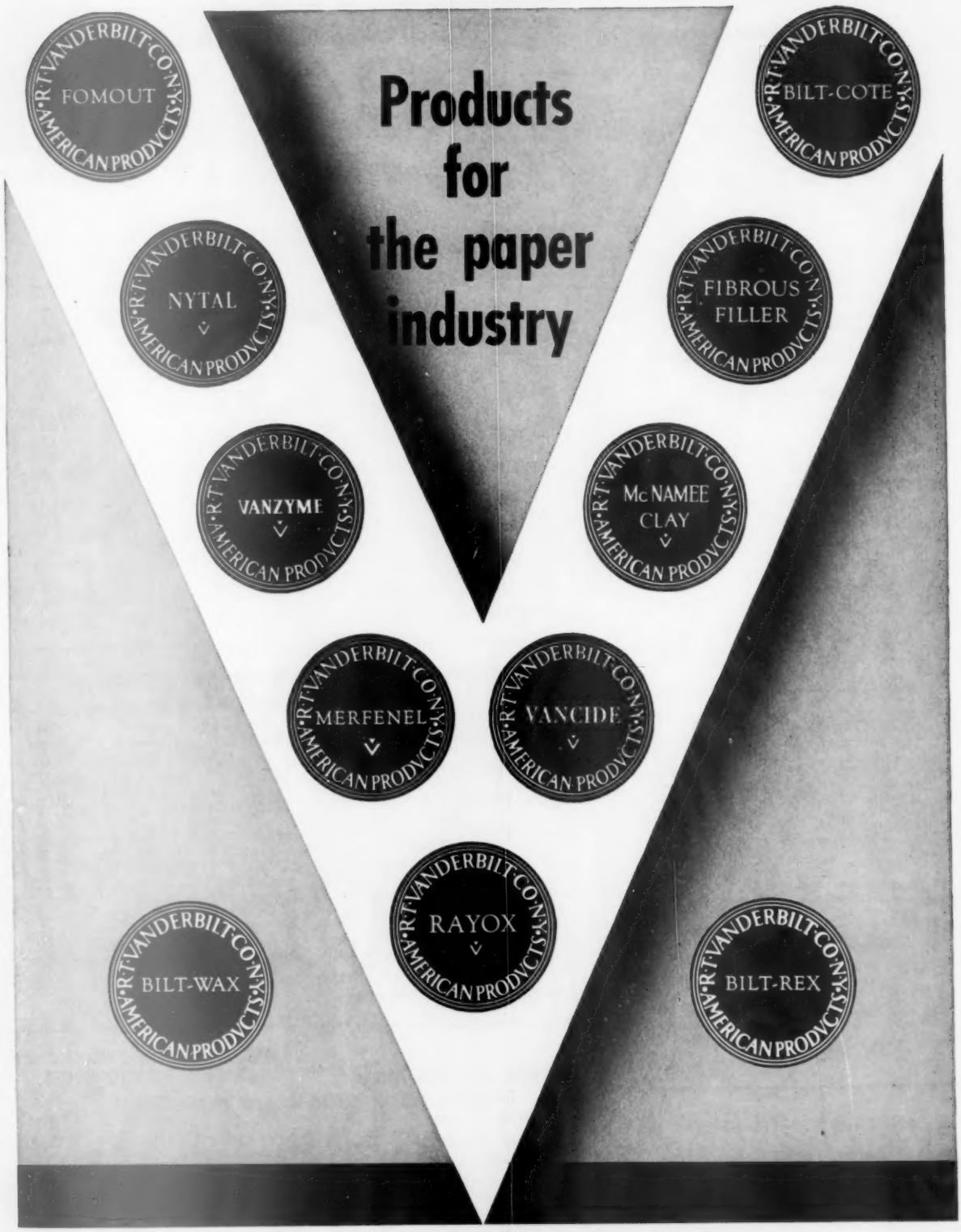
	U.S.A.	Overseas	Total
1935	2,052,000	523,000	2,575,000
1940	2,586,000	657,000	3,243,000
1945	2,534,000	525,000	3,059,000
1950	4,724,000	214,000	4,938,000
1953	4,885,000	455,000	5,720,000
1955	5,070,211	734,902	5,805,113
1957	5,054,729	852,664	5,907,393
1958	4,826,696	1,217,620	6,043,316
1959	5,117,766	834,938	5,952,704
1960	5,259,653	1,005,646	6,752,401

Source: Newsprint Association of Canada.

PULPWOOD PRODUCTION IN CANADA BY PROVINCES

	(1959) Cords	Value
Newfoundland	764,000	$ 21,584,000
Prince Edward Island	31,000	367,000
Nova Scotia	288,000	5,617,000
New Brunswick	1,167,000	21,134,000
Quebec	6,189,000	154,606,000
Ontario	3,582,000	68,059,000
Manitoba	207,000	3,317,000
Saskatchewan	40,000	558,000
Alberta	263,000	4,317,000
British Columbia	2,026,000	33,408,000
All Canada	14,557,000	$312,967,000

Source: Department of Forestry



R. T. VANDERBILT COMPANY, Inc.

230 PARK AVENUE · NEW YORK 17, N. Y.

If you are in the MARKET FOR A CRANE....

you owe it to yourself to do THIS

Before reading the rest of this ad make your own list of what you want in a crane . . .

then read the rest of the ad

You can figure on a crane job with the knowledge that Northwest Cranes bring you everything you need — and within the range of their capacity — more than any other crane on the market today.

- Bases Alloy Cast Steel—of a ruggedness impossible with welded structures.
- Controls that assure a "feel" of the load not possible with air or hydraulics.
- Cool running easily operated Uniform Pressure Swing Clutches that give a smooth accurate control of the swing.
- Torque Converters.
- True Power-Load Lowering.
- Independent High-Speed Boom Hoist.
- Easily lowered Folding Gantrys.
- Flange or Pin Type Booms for easy boom length changes.
- Third Drum of real capacity.
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- Pendent Lines, Boom Struts.
- Independent Boom Hoist Automatic Knockout.
- Differential or Block and Skid Steering.
- Crawler lengths and widths to suit your problems.
- Sectional Jibs.

There are many additional advantages. Space precludes listing. Ask for complete details.

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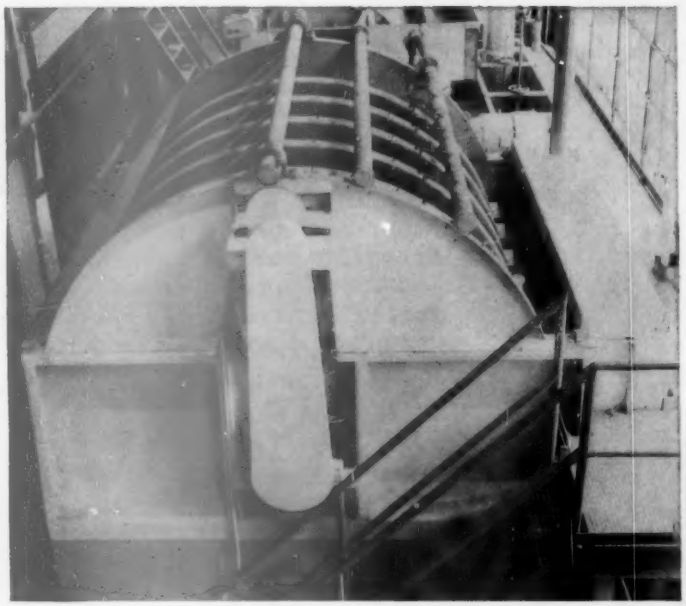
CRANES • SHOVELS • DRAGLINES
PULLSHOVELS • TRUCK CRANES

3/4 to 3 Cu. Yd. Capacity

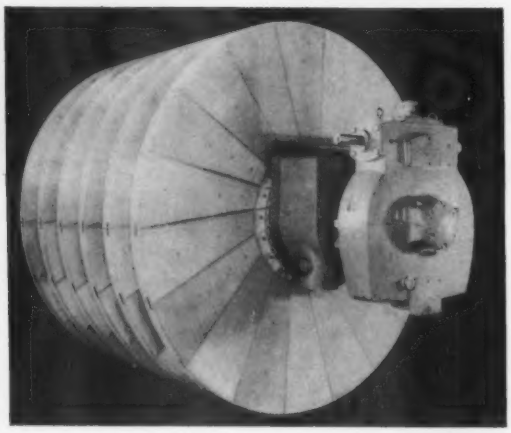
NEW IMPCO

Disc Type Filter Design

At Scott Paper Company, Mobile, Alabama



Molded Discs and One-piece Stainless Core Raise Capacity and Clarity Standards — Due to New Hydrodynamic Design Concept.



Close up your white water system with the new Impco Disc Filter! This saveall concept, with its molded sectors and one-piece stainless core, is a fresh approach to disc type filtering. Hydrodynamic design and latest materials now give you a truly ultramodern filter.

Swept back, molded, lightweight, bonded-face sectors increase capacity and wire life. Contra-flow inlet eliminates pulp thickening in vat. Eighteen ported trunnion and full 180° valve opening produce sharpest filtrate separations. Speeds from ¾ to 4.5 R.P.M. Ask your Impco Sales Engineer for full information and write for Bulletin A5-1.

Above: Six-disc unit minus vat, showing valve and dual filtrate discharge. Filters available in sizes up to sixteen discs. Keyed aligning and attaching device makes assembly of a complete disc the simplest yet. A complete disc consisting of eighteen 22 pound sectors is assembled in one hour.

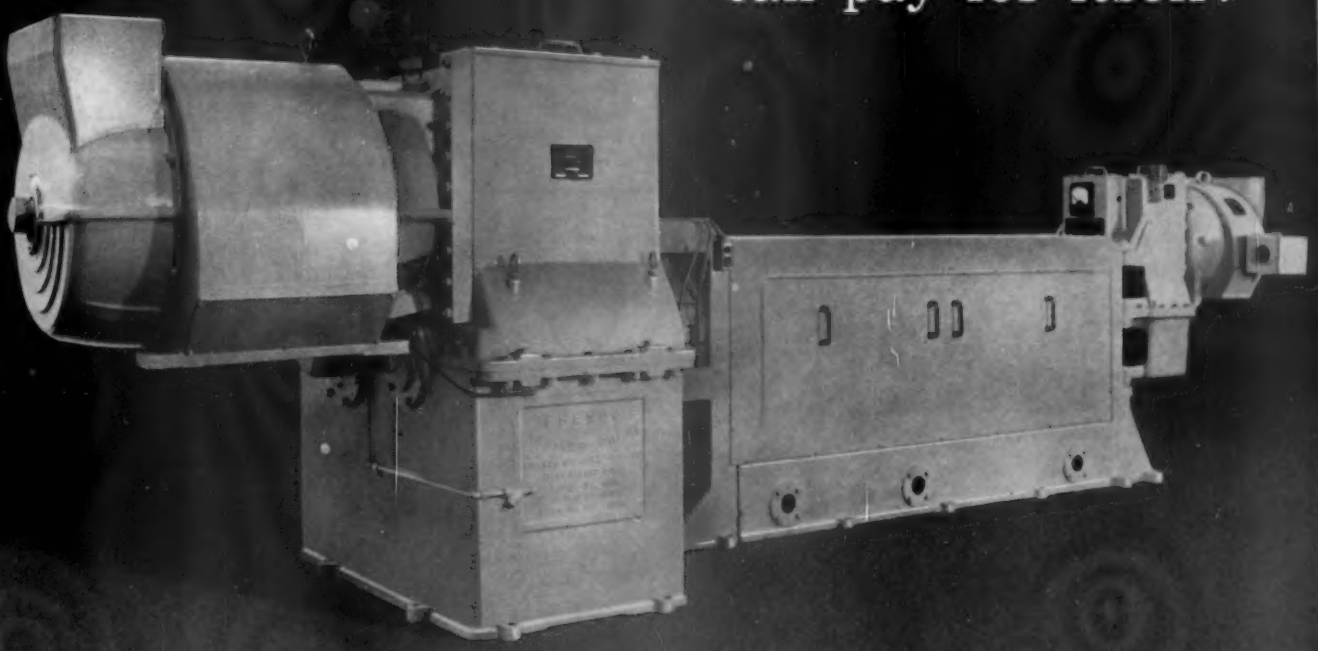
IMPROVED MACHINERY INC. NASHUA, NEW HAMPSHIRE

IMPCO®

IN CANADA: Sherbrooke Machineries Limited, Sherbrooke, Quebec

PROFIT STORY:

New FRENCH press can pay for itself!

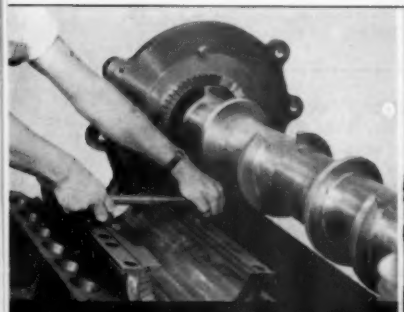


Economical 2-stage continuous screw press uses less power, achieves greater chemical recovery and increases machine production

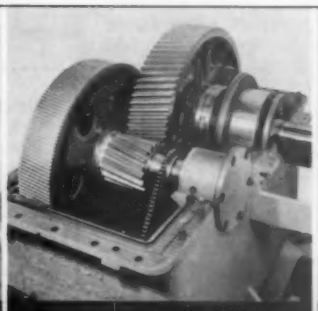
You use less power, because *one* French 2-stage press attains the same washing efficiency as two single stage presses arranged in series, and requires substantially less power. The French 77" barrel, with water injected midway, delivers up to 90% chemical recovery in a single pass. Added benefits are a thoroughly fiberized high quality pulp that usually requires less total refining power and often makes possible increased paper machine production. You buy *one* French 2-stage press instead of two small single stage presses for a substantial capital investment saving. Also 50% less floor space is required. Additional savings are realized because the French press is designed and built for years of trouble-free service. To discover why the new French 2-stage screw press can pay for itself, write for free Bulletin 100 entitled, "How the French 2-stage press cuts costs — increases production" to Dept. A-4.

FRENCH OIL MILL MACHINERY CO.
PIQUA / OHIO

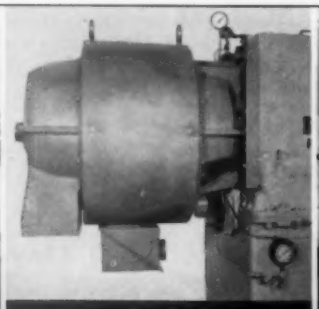
Designers and builders of machines for the Process Industries



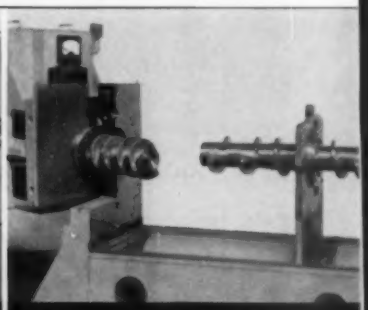
Main drain cage hinged for easy access. Cage can be furnished with inserts into which all wearing parts are assembled for quick removal and replacement.



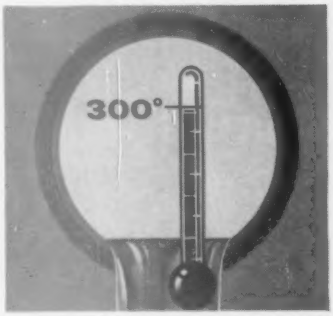
Main drive gears have file hard surface hardened to full depth. Anti-friction roller bearings. Self-circulating lubrication.



Adjustable motor mount (pat.) enables operator to change press speed quickly by loosening motor support clamps, then backing up and raising motor by jack-screw.



Feed worm unit hinged to permit easy separation of feed worm from main shaft. Permits easy removal of wearing segments.



PROTECTION . . . THAT REALLY WORKS!

If you've ever had a pipe deteriorate, you know how serious it can be. Fibercast stands up where others simply won't do. Produced under a carefully controlled manufacturing process, its solid centrifugally cast walls provide positive protection against high temperatures in corrosive environments.

FIBERCAST® epoxy pipe safely handles corrosive solutions to 300° temperatures

Rugged pipe carries 94% of known corrosive solutions. Available now in sizes from 2" to 8"

Heat and corrosion failures cost money. That's why it's important to consider the maximum protection you get with Fibercast epoxy pipe. Protection against premature fouling, generally attributed to operating temperatures and corrosive solutions. Protection against intermittent replacements, downtime—added costs for new materials and labor.

Years of actual operation in field use, prove Fibercast outlasts other kinds of pipe. Even more expensive metal pipe, or pipe with thermoplastic interior coatings cannot match Fibercast's resin rich interior.

Comparative Life Data

Report after report shows that Fibercast does outperform other types of pipe in terms of long service life. Basing Fibercast Grade J at 100% as unit life, comparable ratings show: Aluminum, 26%. Brass (RED), 74%. Rubber Hose, 21%. Stainless Steel (304-40), 31.1% Asbestos (cement C-100), 23.7%.

Handles 94% of Known Corrosive Chemical Solutions

Out of 338 common corrosive solutions, Fibercast safely handles 320. Not only does it provide superior resistance to corrosion, heat and pressure—it also has the outstanding ability to maintain the purity of the solutions it carries. The pipe has a glass-smooth interior with a Hazen-Williams C-Flow Factor of 147. This cuts friction losses. Encourages flow at intended pressures. Resists deposit build-up. Dielectric properties ward off electrolytic action.

Fibercast owes its long life—and its special resistance to heat, pressure, corrosion, contamination, electrolytic action—to the exclusive way it is built. Fibercast is a centrifugally cast thermoset epoxy resin reinforced pipe with multiple layers of seamless braided glass fiber sleeving or especially woven glass fabric. Its body of woven glass fibers, impregnated with epoxy resin chemically cured at elevated temperatures provides remarkable ability to withstand high pressure and temperature in corrosive environments.

FIELD USE PROVES RESISTANCE TO CORROSION . . . 1 Plastic-coated steel nipple (right), used in salt water supply well, corroded and lost strength after 3 months. Fibercast (left), used in same installation for 3 years still shows no loss of strength.

Savings Right from the Start

Fibercast puts you way ahead for your money from time of installation. Light weight makes it easy to handle; (it is one-fourth the weight of steel). Yet it even has structural stability and strength for installation on span racks with the normal metal pipe spacing.

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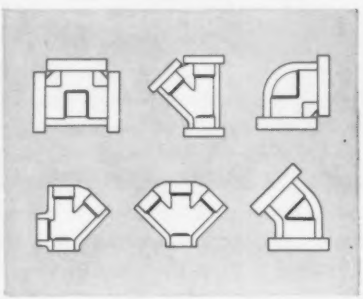
Fibercast offers fittings to solve any fitting problem. Besides a vast stock of standard sizes and types, Fibercast also designs and makes special fitting to meet individual problems. All have the same corrosion resistance properties of Fibercast Pipe and Tubing.



Get the full story on Fibercast Pipe, Tubing and Fittings. Find out how they can help you solve and combat specific problems relating to temperature, pressure and corrosion. Mail coupon today.

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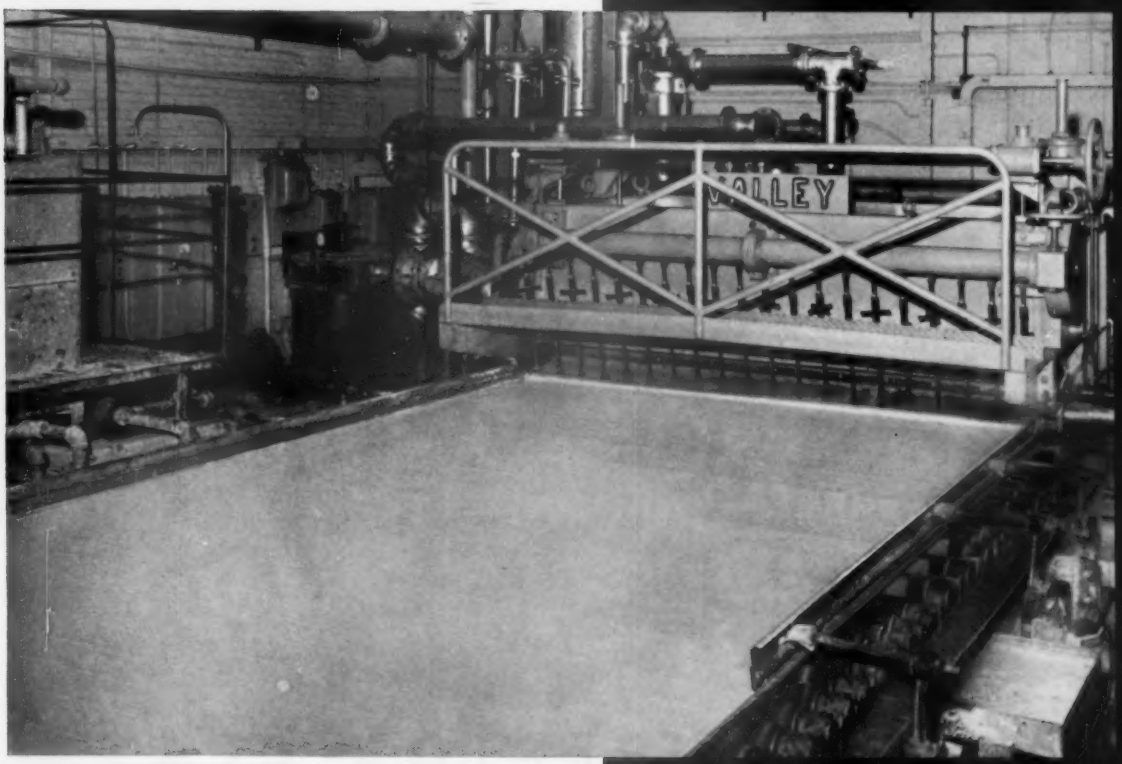

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Thiele Water-Washed Clays are mined from vast holdings in the heart of Georgia's clay belt, carefully tested and controlled while being processed at Thiele's modern plant. Two spray drying plants assure coating clays that will provide EASIER MAKE-DOWN—IMPROVED HANDLING—LOWER MOISTURE CONTENT—MORE UNIFORMITY.

Illustrations show particle size testing and core testing—in Thiele laboratory.

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Thiele Kaolin Company

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Will your mill be next to profit from using new production Waterbury felts?

Mills that have been using our felts for years were the first to comment on the quality of *new production* Waterbury felts, because the improvement was immediately apparent. New mills, of course, know only the performance of our *new production* felts, which they tell us results in easy starts, fine finish and longevity which has led to new records on several machines.

Porritts & Spencer technology is the "magic ingredient" which makes *new production* Waterbury felts better. The full skills of P & S, world's largest producer of papermakers' felts, and their 153 years of worldwide experience, are now at our disposal.

To discover how today's Waterbury felts can benefit you, please phone or write us.

THE WATERBURY FELT CO., INC. Skaneateles Falls, N.Y.

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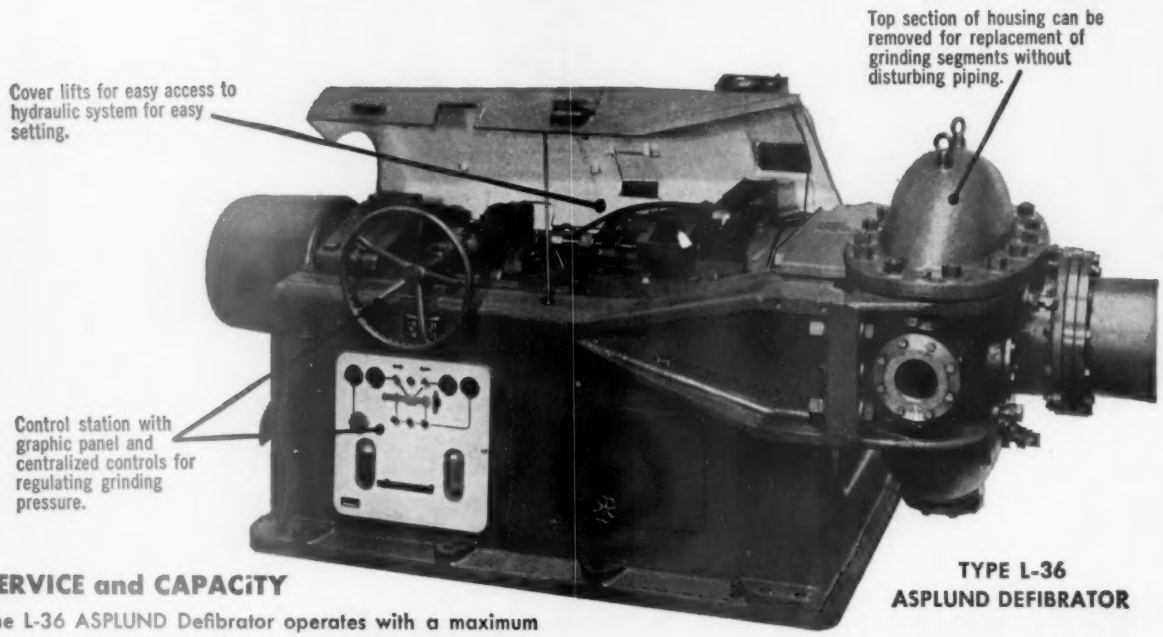
FOR CONTINUOUS PULPING, THE NEW *Asplund* L-36 DEFIBRATOR

offers

- Close control of grade and uniformity of pulp
- Precise adjustments easily made with hydraulic controls
- Continuous service with low maintenance


Top section of housing can be removed for replacement of grinding segments without disturbing piping.
Cover lifts for easy access to hydraulic system for easy setting.
Control station with graphic panel and centralized controls for regulating grinding pressure.

TYPE L-36
ASPLUND DEFIBRATOR

SERVICE and CAPACITY

The L-36 ASPLUND Defibrator operates with a maximum steam pressure of 180 psi, and is used principally for producing fiber for hardboard, insulating board, and roofing felt. It is conservatively rated at 80 tons of hardboard fiber per day. It is also used for semi-chemical pulping and asphalt dispersion with capacity up to 150 tons per day. The size of the Defibrator motor in either case is between 400-600 HP.

CONSTRUCTION

Solidly built for continuous heavy duty service, with double acting thrust bearings and one radial bearing, all lubricated through a circulating oil system by means of a pumping unit with safety controls. Two 36" discs, one rotary and one stationary have replaceable segments; segment holders, housing, and top cover are all stainless steel. The shaft in the main stuffing box is protected from wear by a stellited sleeve.

RELATED EQUIPMENT

Rotary feeders, screw feeders, and digester units are available for use with existing equipment, or coordinated for use with the L-36 ASPLUND Defibrator. Size of feeders and digester units depends on the type of process, the volume to be handled, and the capacity required.

FACTS and FIGURES

When you are planning to add pulping facilities or to modernize, we will be glad to work with you in detail, toward layout and equipment best suited to your requirements.

AMERICAN DEFIBRATOR, INC.
CHRYSLER BUILDING
NEW YORK 17, N. Y.
West Coast: A. H. Lundberg
Mercer Island, Washington

Langston Leader

LEADERSHIP BY DESIGN

JULY, 1961 Published for information of paper and board mills by Samuel M. Langston Company, Camden 4, N.J. VOL. 3, NO. 4

Quality Rolls Produced

LANGSTON WINDER MEETS TOUGH REQUIREMENTS

New York & Pennsylvania Company Paper Serves High Speed Presses

Langston's new Speedmaster is slitting and winding publication grades and a wide range of other papers at New York & Pennsylvania Company's Lock Haven mill, Lock Haven, Pa.

New York & Penn furnishes a large portion of its output of paper to such well known Curtis publications as The Saturday Evening Post, the Ladies' Home Journal and Holiday. The Company also supplies requirements of the market for other grades of book and specialty papers.

For 71 years, New York & Penn's reputation for high quality has been well known to offset and letterpress printers, book and magazine publishers, consumers of mimeograph and duplicating paper, makers of school tablets and converters of many other grades of paper.

• • •

Its policy is to maintain a program of constant improvement and modernization at its three pulp and paper mills (two at Lock Haven and one at Johnsonburg, Pa.) and at its soda pulp mill at Willsboro, N. Y. On a recent company anniversary, a story described this program as follows:

"The company learned early the value of modern machines. From the beginning, research and engineering have been given high priority. New York & Penn has pioneered with many practical innovations that have found wide application in the developing science of papermaking. Millions of dollars have been spent on new and improved papermaking machines, modern equipment, research and engineering in a continuing program to keep the company in the forefront of a highly competitive industry."

• • •

Need for superior paper and rolls calls for maximum diligence. Today's massive, high speed multi-color presses require a high degree of uniformity in the quality of the paper used. The same craftsmanship that meets the exacting requirements of magazine presses is applied in the production of paper to meet the equally exacting and varied needs of other customers who use New York & Penn papers.

Last August Langston's new Speedmaster winder (see Langston Leader of March, 1961) became a part of this continuous modernization program at New York & Penn. The purchase was made after a study of available machines and a conclusion that the principles embodied in the Speedmaster were most compatible with the results desired. These included improved mechanical qualities in the rolls, uniform density, good edges and straight sides free of annular rings and off-set, and the general operating advantages inherent in a winder of this type.

• • •

The Speedmaster services the number 8 machine. The output is supercalendered, machine finished and high bulk grades, offset, mimeo, tablet and lithos.

The Speedmaster at New York & Penn is a 142-inch wide machine with a speed rating of 3000 feet per minute. It has been slitting down to as narrow as six 22⅜-inch rolls from a 137-inch sheet with diameters of rolls ranging up to 45 inches, presently the largest diameter which New York & Penn customers are equipped to handle.

However, in anticipation of a need for rolls of still larger diameters—as

(Continued on next page)

This Issue Is Printed On Penn/Brite Offset

This issue of the Langston Leader is printed on New York & Penn's 80 lb. Penn/Brite Offset. The Company describes Penn/Brite as a sheet which will successfully meet the toughest reproduction problems—be they pin point register, heavy black solids, delicate halftones, air brush vignettes with fine gradations of tones, colors, color overprinting or fine serif type. It is a white, bright and opaque sheet which has met and will continue to meet the "torture tests" of some of the world's most outstanding designers.

LANGSTON'S NEW SPEEDMASTER AT NEW YORK & PENNSYLVANIA CO.

. . . winding top shipping quality rolls

Speedmaster Meets Tough Requirements

(Continued from preceding page)

customer equipment and facilities develop to gain the economies of larger rolls—the winder is built with the capacity now to make rolls up to 60 inches in diameter.

• • •

Slitting and winding a wide range of basis weights from 25 lb. to 120 lb. (25 by 38 inches—500), the Speedmaster is also operating on a wide range of finishes. These include: cover, coated, supercalendered, machine, English, antique, bulky book and vellum.

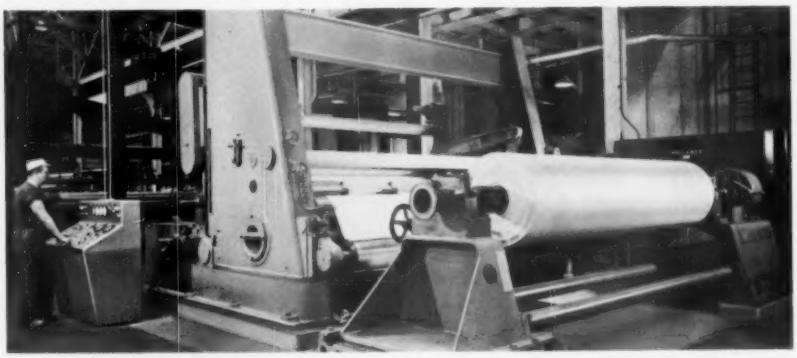
Incorporated in the Speedmaster winder is a new design slitter and spreader assembly. This assembly, mounted as an integral part of a rotatable cradle, positions the slitters and spreader roll in close proximity to the winding drums; thus, providing a very short draw of the slit web with resultant more accurate web control.

Pushbutton operation rotates the cradle, allowing the spreader roll to increase or decrease the degree of spreading required while winding. This inherent design feature provides the flexibility to wind narrow or wide slits, assuring positive roll separation. Similarly, by pushbutton the operator rotates the cradle to its extreme position from which top and bottom slitters can be quickly set up from a standing position on the mill floor.

The winder achieves uniform density by combination of:

• Automatic control of the draw between main winding drums for sheet tension control. (The winder has a two-motor "Torque Control" drive programmed to compensate automatically for the tendency to uncontrolled and increasing roll hardness with increasing weight of the roll.)

• Compensation for the increased weight of the rewound roll through automatic control of rider roll nip pressure.



INSTALLATION INCLUDES Langston backstand with lateral adjustment, oscillation and constant tension braking.

• Automatic rewind shaft lift, to further reduce nip pressure as the roll increases in diameter by counterbalancing the rewind shaft weight and a portion of the roll weight.

• Constant web tension control. (The installation includes a Langston SM reel-type backstand with constant tension breaking, oscillation and hydraulically operated lateral adjustment.)

• • •

Other features of the Speedmaster at New York & Penn include: Langston's new precision-type, power-driven slitters guaranteed to run true within .001"; 25¼-inch diameter winding drums; power-driven rotating spreader roll; power-driven idlers; rewind shaft loader; automatic threading device for ease of thread-up; rewind shaft bearing housings of the spherical, ball-joint type for maximum flexibility in use of rewind shafts and reduction of lateral movement; pushbutton control for quickly lowering or raising the rewind shaft brackets between winding cycles; roll ejector; power engagement and disengagement of slitters; power operated nip guard; and a hydraulic roll lowering table.

Commenting on the Langston Speedmaster, Superintendent Herman Uebel of the Lock Haven mill said:

"We like the type of roll we're getting and so do our customers, who have sent us some unsolicited comments on the improved quality of the rolls since the winder has been in. Our customers increasingly have been specifying that their rolls should be run on a winder of this type for better rolls and straight sides.

• • •

"**Running high bulk paper** as we often do, which can cause roll problems, we're now getting sound shipping quality rolls with uniform density throughout.

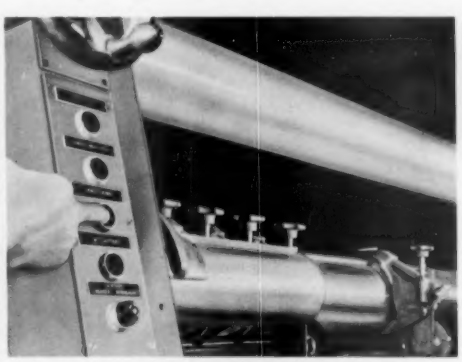
"The winder is easy to handle. Its automatic controls require less judgment and skill on the part of operators. Our crews move on to it like old hands. You can easily change the spreader roll position by pushbutton to assure good clean separation. Slitters are convenient to set up.

"The constant tension control, torque control on the front winding drum and rider roll nip pressure control all combine to give our rolls more uniform density.

"The backstand has shown versatility in handling various finishes and the characteristics that go with each.

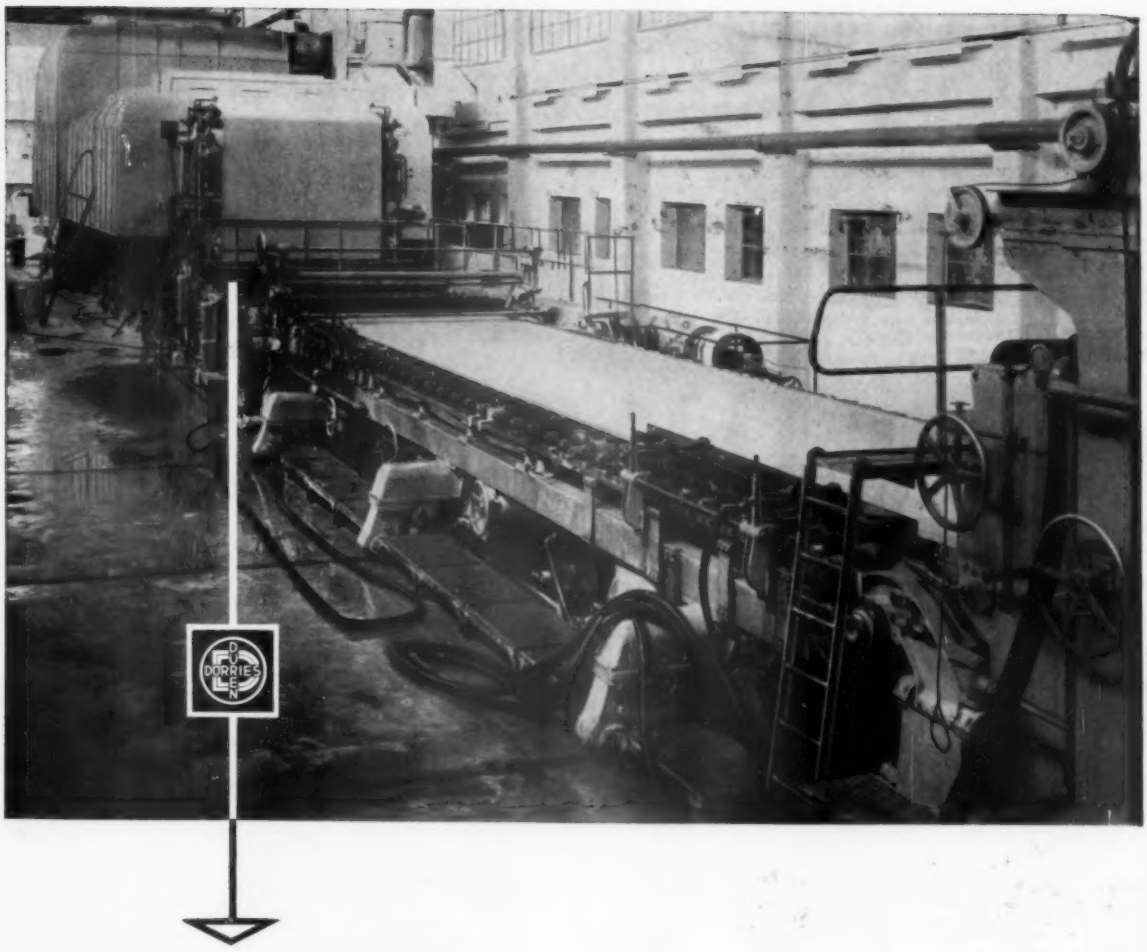
"We feel the Speedmaster puts New York & Penn in a good position to supply larger diameter rolls of top quality when converters and printers begin to get ready for them—and want the economies that larger rolls can bring."

. . . easy access to slitters



. . . pushbutton adjusts degree of spreading

. . . easy separation, good edges, smooth sides



DÖRRIES Paper Machines are proof of solid design

This paper machine was built to produce different grades of M.G. papers at speeds up to 1000 feet per minute and has entirely come up to expectations. It is equipped with all modern features, of excellent workmanship and heavy design.

O. DÖRRIES A.G. DÜREN

Eisengießerei und Maschinenfabriken · Western Germany

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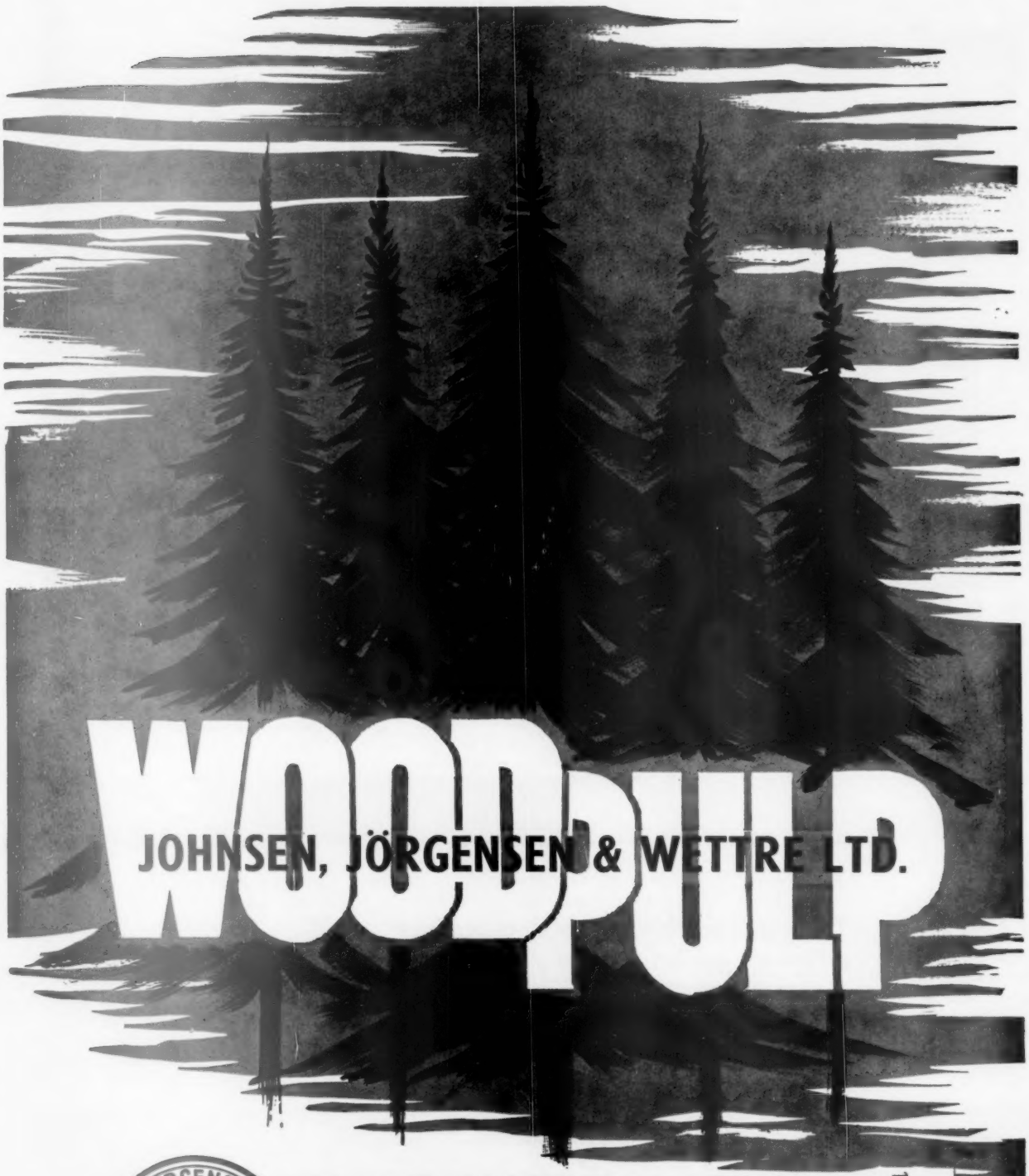

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EUROPE

Pulp and paper production rose sharply in many European countries last year. In the key producing nations—United Kingdom, West Germany, Soviet Union, France, Sweden, Finland—growth was robust. Both the UK and France produced 12% more paper and board in 1960 than in 1959. West Germany boosted production 356,000 tons—the biggest increase since 1954. Russia hiked production by 10%. Sweden turned out enough paper to increase per capita consumption by 10 lbs. Finland topped 2 million tons production for the first time. The story was the same in pulp making—Finland's production is approaching 4 million tons; Sweden's almost 5.5 million; Norway's nearly 1.7 million tons.

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PAPER SACKS hold coal in new French self-service system.

EUROPE

United Kingdom

Greatest advance in history of British papermaking

Population: 52,383,000. Per capita paper and paperboard consumption: 236 lbs. (101 kg.)
Paper and paperboard mills: 225; woodpulp mills: 4; straw and esparto pulp mills: 8

PRODUCTION (short tons)	1959	1960
Paper and paperboard	4,094,912	4,561,881
Total Pulp Production (estimates)	150,000	150,000

Principal paper grades manufactured: All kinds

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	1,542,009	1,843,165
Paper and paperboard exports	222,000	258,905
Pulp imports	2,395,272	2,716,860

Principal paper and paperboard imports from: Canada, Sweden, Finland
Principal paper and paperboard exports to: Australia, New Zealand, Republic of So. Africa
Principal pulp imports from: Sweden, Finland, Norway

By F. H. LLEWELLYN THOMAS, M.A. LL.B.
Editor for United Kingdom

—London

AFTER MAKING THE GREATEST STRIDES in production of paper and paperboard in 1960 of any year in their history, the United Kingdom mills continued in early 1961 a little over the record-breaking pace of last year. The gain in 1960 over 1959 was nearly 12%—a 467,000 short tons increase to a record output of 4,561,881 short tons.

It was hardly to be expected that such a rate of increase could be maintained in 1961, and of course, it hasn't been. The latest figures show total output of paper and board a little above equivalent periods of last year. The average weekly output in February was about 1,000 tons higher than in January.

Some wrappings, which showed a weakening tendency early this year, later recovered. In fact kraft papers and straw papers were 6% and 1% higher, respectively, than last year. There was a slight decrease in the output of newsprint in the early part of the year, but there are signs of improvement. General wood-free printings showed a considerable improvement, being 2,000 tons higher than last year—that is, about 15% above the level of 1960.

F. H. LLEWELLYN THOMAS, M. A., LL. B., secretary of both the British Paper & Board Makers' Assn. and Paper Makers' Straw Trading Co., headquarters in London, is our editor for the United Kingdom.

The result of the reduction of duty in 1960, under the European Free Trade Association agreement, shows some influence particularly in the imports of kraft board and kraft liner. With any further reductions there is no doubt that there will be a possibility of important increases, especially with the increased capacity now available on the Continent and the increased production in traditional export markets. With the increase in the wage bill, certain raw materials and ancillaries, difficulties will increase but will be faced with the usual resilience of the United Kingdom paper trade.

In paperboard, the position is still good, although the rate of increase in 1960 is not so good as it has been for some little time. With the development of buying generally in recent months, there should be some improvement.

More Waste Paper Used

One raw material which deserves special mention is waste paper. During 1960 the mills received 1,358,922 tons of waste paper and used 1,339,833 tons (compared with 1959 receipts of 1,223,009 tons and consumption of 1,226,237 tons).

For the third successive year, mill

UNITED KINGDOM
PAPER and BOARD PRODUCTION
(in thousands of short tons)

	1939	*1946*	*1953*	*1956*	*1957*	*1958*	*1959*	*1960*
Newsprint	897	330	676	720	731	690	753	831
Mechanical papers	256	112	294	404	356	392	354	418
Chemical wood papers	233	113	161	236	238	273	319	380
Esparto paper & boards	270	240	243	290	284	271	271	301
Rag & handmade paper	46	41	37	44	31	37	38	42
Kraft	169	151	222	275	288	301	349	380
Other wrapping (mainly food)	68	49	67	76	90	81	81	90
Other wrapping	169	187	221	231	298	217	242	279
Strawpaper	67	47	106	182	215	215	243	254
Building boards	75	53	49	59	67	69	69	76
Other boards	602	517	815	979	1,040	1,080	1,138	1,235
Wallpaper	49	26	47	65	71	81	77	92
Industrial & misc. papers	45	41	50	66	80	98	110	120
Total	2,946	1,907	2,988	3,627	3,779	3,805	4,044	4,498

Among Biggest Companies In United Kingdom

In this alphabetical list of the major paper companies or groups in the United Kingdom, no attempt is made to place them in order of size:

Alders Group
Associated Paper Mills
Barrow Paper Mills Group
Bowaters Paper Corp. Ltd.
Robert Fletcher Group
Inveresk Paper Co. Ltd.
Reed Paper Group
Reed and Smith Group
Robinson Group
Wallpaper Group
Wiggins Teape Group

receipts and consumption reached new record levels, but 1960 broke more records by showing record increases over the previous year. In 1960 receipts and consumption were 11% and 9% respectively, above the 1959 totals.

In addition to the waste paper reaching the mills, 99,599 tons were exported. These exports represent 2.1% of the recoverable paper.

Importance of Exports

The importance of exports to British economy was stressed particularly by Sir William McFadzean, president of the British Federation of Industries, at the 1961 annual meeting of the British Paper and Board Makers' Assn. There are many difficulties in the way with currency problems, quotas which still exist in quite a number of countries, and the growth of new papermaking production in traditional markets; but despite these, British papermakers hope to make 1961 a good year in export. In fact, apart from newsprint which as an export quality has to be studied separately, the export of specialties and indeed of general papers was pretty good in 1960.

Election of Leaders

At the 90th annual general meeting on March 16th, John F. T. Langley, J.P., was re-elected president for the year 1961/62. William R. M. Watson, T.D., was re-elected deputy-president; J. Barcham Green was re-elected honorary treasurer; and James Henderson Black, J.P., C.A. was re-elected honorary assistant treasurer.

The annual dinner of the Technical Section was held on March 22. W. A. Gilmour, B.Sc., of Tullis Russell & Co. Ltd. of Scotland, was re-elected chairman, and Philip H. Prior, B.Sc., of Albert E. Reed, was re-elected vice-chairman.

Scandinavian, Austrian Imports

The competition of increasing imports in the paper market of the United Kingdom is of major concern to the British industry. Their leaders have made this clear many times, especially at the annual meeting this year where President Langley frankly made it known the association was not entirely in agreement with their guest of honor, Sir William McFadzean, who defended the European Free Trade Association and urged support for a united European Common Market and reduced tariffs.

The Scandinavian nations and Austria are members, with Britain, in EFTA, and therefore benefit from the acceleration of tariff reductions, and the increasing imports by Britain from those nations is evidence, say the British papermakers. As a matter of fact, in mid-1961 this was a moot point in differences as regards slight reductions which Scandinavians offered in third quarter pulp sales. At least one leading British buyer asked for more, and it was indicated that paper and board prices in Britain, resulting from the EFTA tariff reductions, would have an important bearing on future pulp sales and prices.

A big issue in Britain as this review went to press was whether it should

UNITED KINGDOM—PAPER and BOARD EXPORTS
(in short tons)

	Newsprint	Other Uncoated Printing	Writing Paper in large sheets	Uncoated Board	Coated Paper	Coated Board	Other Paper & Board & Mfrs.
Av. 1936-7-8	70,985	57,675	13,796	15,103	9,397	2,277	55,414
1946	17,292	20,854	12,606	6,572	12,401	1,888	50,584
1953	139,786	20,595	5,873	8,510	17,020	3,022	85,209
1954	143,033	24,836	6,577	9,975	23,580	5,749	97,005
1955	155,229	28,215	6,831	10,081	26,953	4,537	102,752
1956	152,446	47,888	5,776	11,259	21,778	4,331	56,706
1957	136,377	50,256	4,771	10,308	22,089	6,068	50,806
1958	116,795	47,722	4,899	15,136	21,114	8,194	49,128
1959	90,975	44,151	5,573	19,437	23,619	12,374	77,957
1960	52,048	43,282	6,581	20,012	30,864	12,416	93,702

UNITED KINGDOM—PAPER and BOARD IMPORTS
(in short tons)

	Newsprint	Packing & Wrapping	Fibre-Building Board	Other Uncoated Board	Coated Paper	Coated Board	Other Paper & Board & Mfrs.
Av. 1936-7-8	495,644	303,292	32,672	403,184	7,771	26,790	53,300
1946	116,584	81,547	40,824	105,029	564	3,222	17,300
1953	262,050	154,625	73,613	239,872	615	2,180	20,345
1954	366 242	238,156	139,966	368,778	730	3,784	33,079
1955	451,143	302,294	188,422	433,377	727	3,898	37,001
1956	537,138	252,814	161,326	333,857	1,031	2,799	36,000
1957	554,034	290,331	207,548	362,098	1,396	2,998	39,211
1958	584,064	310,901	188,295	332,016	1,200	3,764	41,460
1959	570,274	387,775	234,917	267,109	3,067	7,319	112,579
1960	689,232	467,403	252,343	357,573	4,589	17,712	54,313

UNITED KINGDOM—IMPORTS OF RAW MATERIALS

	Roundwood (piled cu. fathoms)	Woodpulp Paper Grades (short tons)	Woodpulp Dissolving (short tons)	Esparto, Grasses (short tons)	Rags (short tons)
1938	102,305	1,812,116	88,903	348,556	16,781
1954	86,201	1,883,702	264,505	347,669	23,965
1955	85,046	2,225,420	285,902	339,826	33,199
1956	82,256	2,227,238	237,485	253,507	23,587
1957	87,896	2,164,146	231,325	211,287	21,731
1958	55,752	2,135,438	218,723	206,154	20,392
1959	71,806	2,250,533	273,566	212,387	26,203
1960	76,813	2,716,860	320,418	258,014	25,679

UNITED KINGDOM—RAW MATERIALS AND PAPER

Thousands of Short Tons—Source: Board of Trade

	Consumption							Newsprint		Total Paper	
	Pulpwood	Woodpulp	Esparto	Rags	Straw	Waste Paper	Paper Produced	Imports	Exports	Imports	Exports
1938								491	62	1,177	193
1939							2,894				
1946	113	995	100	147	321	680	1,908	114	16	357	126
1949	230	1,272	386	152	93	844	2,475	199	66	509	199
1950	332	1,724	330	146	107	965	2,835	151	111	736	298
1951	n.a.	1,983	389	152	168	998	3,100	171	95	973	265
1952	n.a.	1,608	238	119	136	890	2,750	261	73	635	219
1953	94*	1,670	266	132	134	1,024	2,988	275	139	753	280
1954	89*	1,868	366	155	140	1,170	3,391	366	143	1,151	311
1955	82*	2,071	337	159	145	1,228	3,647	451	155	1,416	334
1956	175	2,064	293	149	111	1,189	3,603	537	152	1,163	299
1957		2,176	224	146	64	1,228	3,712	554	136	1,259	263
1958	160*	2,233	209	143	53	1,310	3,923	584	117	1,462	293
1959	272	2,303	222	139	40	1,369	4,095	570	91	1,583	274
1960	347*	2,577	245	146	44	1,501	4,562	689	52	1,843	259

* In addition to this tonnage of pulpwood, there were 72,320 piled cu. fathoms of "roundwood" in 1953; 86,320 in 1954, 78,900 in 1955, 74,940 in 1958, 74,360 in 1959 and 84,020 in 1960.

join the six-nation European Economic Community, France, W. Germany, Italy and Benelux. One Labor Party leader called it the most crucial decision of British history. The EEC, of course, was still at this time a "rival" trade bloc to the EFTA, to which Britain, Scandinavia and other nations belonged, so these questions were of the greatest importance to the British paper industry, which has been finding itself on the "losing side" in British governmental decisions as they concerned trade bloc and tariffs.

Companies Become International

One solution to the British paper industry's problems vis-a-vis its government and other industries is possibly demonstrated by the increasing investments being made abroad by Bowaters, the Reed Group, Wiggins Teape, Nash and others in setting up operations or joining in manufacturing with local firms in several European countries, Australia, New Zealand and South Africa.

This significant trend is possibly best exemplified by the 1961 annual report by Sir Eric Bowater. While revealing that his company has increased its common stockholders in ten years from 4,000 to nearly 70,000, he noted that it has investments in manufacturing in 12 countries.

Issued capital now amounts to £40.6 million ($113.8 million) and Bowater production of paper, pulp, packaging and other products reached 2¼ million long tons in 1960, an increase of 22 per cent over 1959. Sales were up 21 per cent to £142 million ($398 million).

A new flexible packaging plant at Gillingham in Kent is newest Bowater addition. The report stated that Bowater has a "stake in the Common Market (EEC)" through acquisition in June 1960 of Papeteries de la Chapelle, one of the three biggest integrated pulp and paper mills in France, and of La Cellulose de Strasbourg, one of the major pulp mills in France. These bring Bowater investments in the EEC countries to £12 million ($33.5 million). Bowater's interest in Tasman Pulp & Paper Co. of New Zealand, where a new machine will bring production to 200,000 tons of newsprint per annum, was noted. North American profits of Bowater were over $41 million after depreciation and taxation charges.

Forecasts that paper consumption in Europe will double by 1975, that there will be an increase from 36 to 59 million tons consumption in U.S. by 1975 and that consumption in Australia and New Zealand will double by that year were cited as "solid reasons for regarding Bowaters future in international terms."

Sweden

Paper consumption climbs as many mills add to facilities

Population: 7,494,000. Per capita paper and paperboard consumption: 265 lbs.
Number of paper and paperboard mills: 67; woodpulp mills: 82

PRODUCTION (short tons)	1959	1960
Paper and paperboard	2,062,000	2,371,000
Chemical woodpulp	3,759,000	4,270,000
Mechanical pulp	1,045,000	1,210,000
Total Pulp Production	4,845,000	5,480,000

Principal paper grades manufactured: Newsprint, kraft, paperboard

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	22,000	25,000
Paper and paperboard exports	1,209,000	1,404,000
Pulp exports	2,953,000	3,229,000

Principal paper and paperboard exports to: West Germany, U.K., Denmark, Netherlands, Brazil
Principal pulp exports to: U.K., West Germany, France, Italy

DR. PER OLOF ANDERSSON, our editor for Sweden, is assistant to Dr. Borje Steenberg, head of the paper technology department at the Swedish Forest Products Research Laboratory. He is also a technical editor of Svensk Papperstidning (Swedish Paper Journal), the official organ of the Swedish Paper Mills Assn., the Swedish Assn. of Pulp and Paper Mill Engineers and the Swedish Assn. of Forest Tree Breeding. He graduated from the Royal Institute of Technology in Stockholm.

By DR. OLLE ANDERSSON
Editor for Sweden

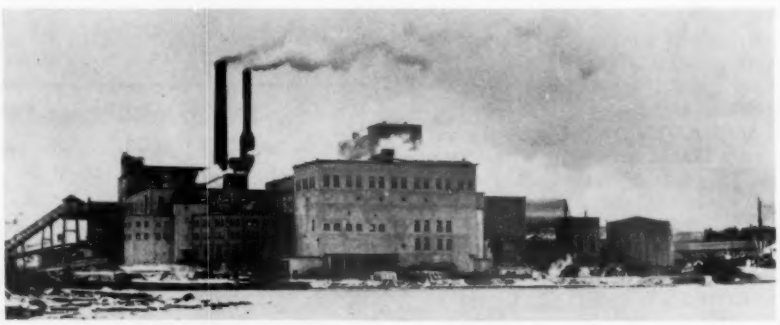
—Stockholm

PER CAPITA PAPER CONSUMPTION in Sweden rose another 10 pounds per person from 1959 to 1960 to a record high of 265 pounds, virtually equivalent to Canada's with only the U.S.A. higher in the world. This is about twice or three times the rate of consumption of many other European countries.

The 82 pulp mills of Sweden made a record 5,480,000 short tons of woodpulp, nearly 80% in chemical grades, this being a half million tons more than in 1959. Pulp capacity increases continue in 1961 and 1962.

As for paper and paperboard, production reached 2,371,000 tons in 1960, an increase of 300,000, and this rise is continuing, also. In the first quarter of this year, Swedish paper and board mills produced 582,000 tons, a 5% increase over the similar period last year. Paper sales were 2% higher in the first quarter. Exports were up 9%.

The Swedish packaging industry has undergone a rapid expansion in the past 10 years, calling for more production of paper and paperboard for this purpose. Packaging products produced in 1960 were valued at 850 million kronor ($170 million) as against only 320 million kronor in



STEADY EXPANSION PROGRAM at the Husum mill of Mo och Domsjo in North Sweden makes it one of the largest market pulp mills in the world. Under Manager Erik Dietrich, it has increased kraft pulp production from 550 short tons (500 metric tons) to 770 short tons (700 metric) per day. It added an 8 stage bleach plant designed by Kamyr, with two chlorine dioxide stages. Washers are Dorr-Oliver. Four digesters have been added. The latest No. 4 pulp dryer is by Dorries, West Germany (wet end) and Svenska Flakt (dry end).

"Big Ten" in Paper In Sweden

The ten biggest Swedish paper mills, in order of tonnage produced in 1960:

Holmens Bruk
Swedish Cellulose
Stora Kopparberg
Billerud
Fiskeby
Uddeholm
Korsnäs
Munksjö
Papyrus
Mölnbacka

1950, ten years earlier. The largest increases in this decade were accounted for by paper and board packaging, up 152%, whereas tin cans and glass increased only 98 and 63% respectively. Plastics, introduced during the period, accounted for 60 million of the 850 million kronor packaging production value in 1960.

A 50% increase in consumer packaging in frozen foods in Sweden is predicted in the next five years. Self service stores have increased in Sweden from 120 to 5,700 in 10 years, a major stimulus to packaging growth. A Swedish pyramid shaped paper container invention, Tetra Pak, is now licensed for manufacture in more than 40 countries of the world.

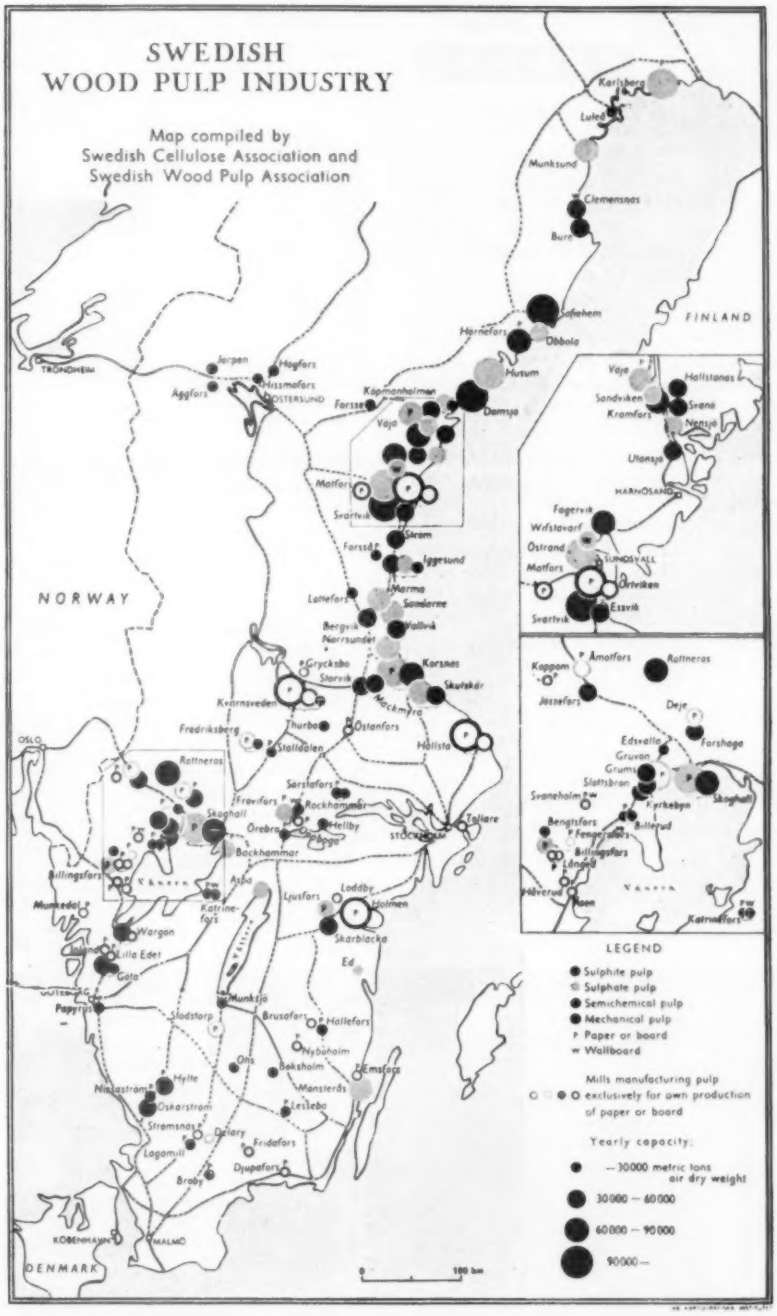
Pulp Capacity to Rise

Early this year, the Swedish Cellulose Association and Swedish Wood Pulp Association announced a new program for Swedish pulp production —revised upward substantially after collecting information from member companies.

Indications are that—after an increase in capacity of 200,000 tons this year—the total annual capacity at the end of 1960 will be 4.2 million tons of chemical pulp, 70,000 tons of semi-chemical pulp and 1,380,000 tons of mechanical pulp, or about 5.6 million tons in all. During the four years 1961-1964, total capacity will be increased by around 1.5 million tons so that, by the end of the period, total output will have risen to some 7.1 million tons, i.e., 5.5 million tons of cellulose, 100,000 tons of semi-chemical pulp and 1.5 million tons of mechanical pulp.

The increase in capacity has been, and will continue to be, more rapid than had been estimated in 1958.

Total capacity will by 1963 have reached 6.8 million tons, as compared with the 6.4 million tons indicated in the assessment of 1958. This increase is mainly due to new mill projects announced since 1958.



Present Plans—65% For Market

Of the total increase in capacity of 1.5 million tons for the four years 1961-1964, about 950,000 tons, or nearly 65%, is currently intended for the production of market pulp, while the remaining 550,000 tons will probably be used for the integrated manufacture of paper and paperboard.

By the end of 1960 the production capacity in respect of chemical pulp for sale will be 3.05 million tons, and the corresponding figure for mechanical pulp will be 630,000 tons. At the end of the period under review, that is at the end of 1964, it is expected that the figures will be about 3.9 million tons of chemical pulp—an increase of 350,000 tons—and 680,000 tons of mechanical pulp—a rise of 50,000 tons.

The increase in production capacity as regards chemical market pulp mainly covers bleached grades—dissolving pulp, bleached paper sulfite and bleached paper sulfate—which, together, will account for almost 75% of the total increase in chemical pulp

EUROPE

for sale. Additional integrated production will refer mainly to sulfate pulp and mechanical pulp. This means that increased capacity will be mainly in respect of kraft paper, newsprint and allied grades.

Swedish exports of paper and board in February, 1961, amounted to 114,100 tons, as compared with 112,300 tons in January, 113,600 tons in December and 107,200 tons in February, 1960. During the two first months of this year total Swedish paper and board exports amounted to 226,400 tons, as compared with 204,300 tons a year ago. Newsprint exports amounted to 29,700 tons in February (a year ago: 27,200) and to 66,000 tons in January-February (62,600). Kraft paper exports amounted to 38,800 tons in February (39,350), and to 74,550 tons in January-February (72,300.).

SWEDEN—Paper and Board Produced

(In thousands of short tons)

	News	*Kraft*	*Fine*	*Board*	*Total (Includes all other grades)*
1937	303	249	79	135	1,004
1946	290	254	110	162	1,074
1950	358	345	112	210	1,301
1951	366	369	133	231	1,401
1952	365	306	122	157	1,202
1953	372	371	123	207	1,352
1954	373	442	137	260	1,536
1955	397	469	155	264	1,643
1956	457	488	167	265	1,733
1957	476	510	191	287	1,853
1958	498	470	179	293	1,857
1959	557	527	187	334	2,062
1960	641	610	211	373	2,371

What Mills in Sweden Are Doing to Expand

Two new large kraftliner board mills in the extreme north of Sweden began operations this year. Each has an annual capacity of 100,000 tons per year and they are only a few miles apart. Most of their production is for Europe to meet fast growing demands for fiber boxes on the Continent.

The Munksund mill, built by Swedish Cellulose Co., was starting up its 248 in. (6.3 meters) trim width machine in June. It represented an investment of $17 million. Market pulp was previously produced at this site and to compensate for loss of this export pulp, SCA expanded at Obbola, thus keeping the export quantity unchanged.

The government-owned kraftliner mill in the north is at Pitea. In this mill as also at Munksund, the machine is a Beloit Fourdrinier.

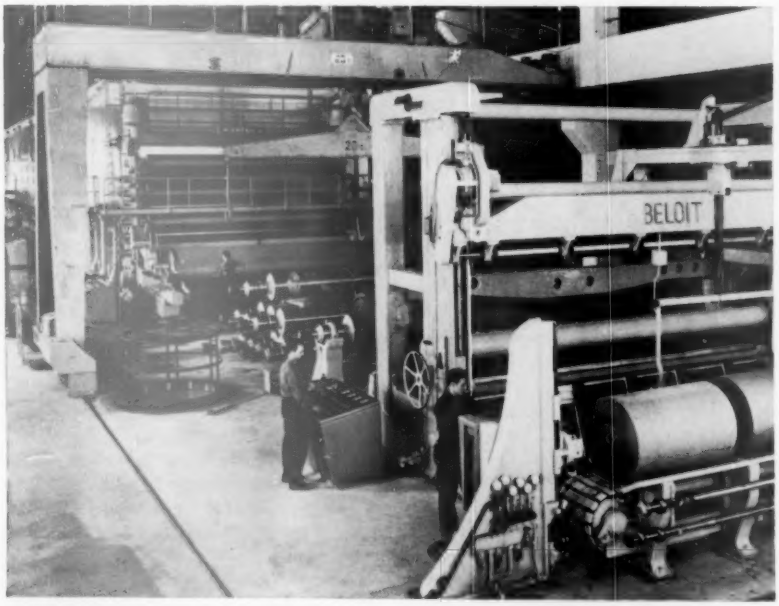
Fiskeby Fabriks AB has embarked upon a program to double capacity of its operations at Norrköping. By 1963, this modernized mill will be producing 200,000 tons of paper and board annually. A Beloit 65,000 ton kraft machine, a 20,000 ton combined kraft and sulfite machine, conversion of an old sulfate pulp mill to semi-chemical pulp for corrugating (fluting) and expansion of sulfate pulp to 185,000 tons are projected. A 160 million kroner investment is aimed at anticipated increased markets in the European trade blocs.

The Bergvik och Ala Co. has launched an expansion program to increase kraft pulp production at Sundarne from 75,000 to 100,000 tons and electric power will be doubled. A 60,000-ton sulfite mill is at Bergvik. This company already has spent $13,000,000 on improvements including bleaching in the past several years.

The Mönsteräs mill (Skogsägarna) operated by Swedish Forest Owners Cellulose Co., which began operations only in 1959 with 70,000 tons capacity, is doubling this production in kraft bleached and unbleached. Its affiliated enterprise at Mörrum, also in South Sweden, is also to make kraft pulp.

The new kraft paper mill of Wifstavarf near Sundsvaal, built at cost of 40 million kroner ($8 million) started up in May 1961. Wärtsilä-koncernen of Finland built the largest kraft machine in Sweden for this mill. It is 530 cm. wide, 100 meters long, with speed of 600 meters per minute. It has a Flakt dryer.

First Swedish built mill for making creped paper was started up at Katrinefors Paper Mill, owned by Swedish Match Co., in West Sweden. Built by Karlstads Mekaniska Werkstad, the machine will produce 12,000 tons annually. A new Walmsleys (British) machine for Billeruds is also a recent addition for kraft paper manufacture.



LARGEST AND FASTEST KRAFT PAPER MACHINE in Sweden at the Wifstavarf mill near Sundsvall, started up in May 1961. Wartsila-koncernen of Helsinki, Finland built 100-meters (300 ft.) long machine with annual capacity of 60,000 tons of paper. Trim width is 530 cm., speed 600 meters/minute. Beloit winder at right in picture.

SWEDISH PAPER EXPORTS

	Metric Tons 1960	% of Total Exports 1959	1960
Europe			
EEC (Inner Six Nations)	505,000	40	37
EFTA (Outer Seven Nations)	360,000	28	26
Other European Countries	55,000	4	5
Sub-total	920,000	72	68
South America	120,000	10	11
Asia	80,000	6	8
Africa	60,000	5	5
Australia and New Zealand	60,000	5	5
North and Central America	25,000	2	3
TOTAL	1,265,000	100%	100%

Holmens Co. at Hallstavik is building its second additional newsprint machine within a few years.

The Hylte Bruks Nymölla A.B. subsidiary in the South is building a new mill at Ivetofta which will introduce the first Magnefite pulping and magnesium sulfite recovery process to Europe. Plant and equipment costing $1,000,000 is mainly produced by Babcock & Wilcox Co. It permits use of many wood species and eliminates stream and air pollution.

Munksjö Co. Jönköping, in the South, is expanding its Vaggeryd kraft pulp mill from 50,000 to 80,000 tons, increasing bleaching at Aspa to 60,000 tons, and modernizing paper mills at Jönköping and Timra, all of which is costing $12,000,000.

Stora Kopparberg has been conducting a three-year expansion program at Skutskär for production of its new two-stage Stora soda base sulfite pulp, with a huge new recovery plant and Karlstads Mekaniska Werkstad Fourdrinier machines and much other new equipment. By next January Stora will start up another new mill in Nova Scotia, North America, to make this soda pulp.

Körsnas AB, at Gävle, like Stora, is now using birch for pulp and it is carrying out an extensive expansion of kraft pulp and paper also. As previously reported, the mills of Uddeholms, Mö och Domsjö, Billeruds and other major Swedish pulp companies have been modernizing and expanding over recent years.

Wallboard Production Up

Production of wall board in Sweden rose by 51,000 tons to 608,000 tons in 1960, with exports up by 24,000 tons to 414,000 tons, Home market deliveries also increased.

Out of exports 377,000 tons were accounted for by hardboard and 37,000 tons by insulating board. Practically the entire increase in 1960 output, 50,000 tons out of 51,000, was also accounted for by hardboard.

SWEDEN—Paper Exports

(In thousands of short tons)

	News	Kraft	Sulfite Wrapp'g	Greasepr'f Parchm't	Board	Total (Includes all other grades)
1937	222	202	128	24	69	694
1946	141	147	82	18	61	493
1950	226	256	105	30	130	816
1951	222	261	110	29	124	811
1952	240	192	61	21	67	624
1953	227	262	76	26	126	784
1954	213	314	88	27	154	868
1955	218	343	92	29	155	916
1956	275	376	89	31	157	1,013
1957	297	380	94	30	170	1,081
1958	306	346	90	28	163	1,055
1959	355	402	96	29	198	1,209
1960	436	456	108	32	210	1,404

SWEDEN'S WOODPULP EXPORTS TO ALL COUNTRIES AS COMPARED WITH EXPORTS TO THE UNITED STATES

(In Short Tons)

Years	Bleached Sulfite	Unbleached Sulfite	Bleached Sulfate	Unbleached Sulfate	Ground-wood	Dissolving*
1938 (To All Countries)	304,078	571,077	92,793	575,508	297,420	
1944 (To All Countries)	156,340	710,709	13,088	70,889	10,600	
1945 (To All Countries)	262,146	49,787	41,273	536,114	314,054	
1945 (To U. S.)	56,496	283,959	28,070	274,429	27,933	
1950 (To All Countries)	632,082	609,404	250,326	501,324	312,224	
1950 (To U. S.)	49,350	99,562	89,663	103,932	12,763	
1951 (To All Countries)	601,114	526,089	267,647	455,863	326,661	
1951 (To U. S.)	30,522	51,344	71,765	58,562	6,767	
1952 (To All Countries)	490,747	406,386	248,861	352,272	296,231	
1952 (To U. S.)	26,776	61,356	72,714	41,855	12,634	
1953 (To All Countries)	385,133*	584,020	355,787	521,267	341,105	409,782
1953 (To U. S.)	45,262	79,408	106,635	65,091	14,744	3,773
1954 (To All Countries)	273,680	574,310	337,370	465,630	396,000	407,440
1954 (To U. S.)	22,330	44,110	88,330	49,170	13,403	1,320
1955 (To All Countries)	329,699	557,097	346,698	475,246	424,101	405,146
1955 (To U. S.)	18,706	27,772	81,744	54,825	9,313	78
1956 (To All Countries)	403,176	553,990	402,137	556,261	475,923	416,208
1956 (To U.S.)	23,006	36,672	86,555	61,058	6,598	—
1957 (To All Countries)	392,347	527,573	416,645	500,735	455,128	419,594
1957 (To U.S.)	19,741	21,899	65,093	40,995	1,123	121
1958 (To All Countries)	439,319	456,839	498,694	460,489	380,446	362,589
1958 (To U.S.)	26,474	33,037	75,720	40,902	7,456	—
1959 (To All Countries)	513,670	459,181	607,024	599,287	397,111	376,702
1959 (To U.S.)	57,853	41,809	90,575	76,951	9,239	1,671
1960 (To All Countries)	523,800	469,214	644,004	679,166	455,500	458,262
1960 (To U.S.)	32,764	33,718	70,161	55,227	5,543	48

* *From 1953, dissolving grades are listed separately.*

SWEDEN—Pulp Produced

(In thousands of short tons)

	Mech.	Sulfite Bleached	Sulfite Unbl.	Dissolving	Sulfate Bleached	Sulfate Unbl.	Total Chem.
1937	809	514	1,290		96	1,176	3,076
1946	747	556	802		132	777	2,267
1950	794	735	831		272	869	2,712
1951	800	772	858		319	904	2,853
1952	751	698	774		327	793	2,592
1953	612	442	756	322	342	771	2,777
1954	850	456	850	404	426	985	3,121
1955	937	516	896	413	450	1,046	3,321
1956	1,020	568	925	411	480	1,113	3,493
1957	1,058	612	849	458	526	1,164	3,609
1957	1,059	612	849	458	526	1,164	3,609
1958	977	657	825	392	585	1,058	3,517
1959	1,045	700	797	397	692	1,173	3,759
1960	1,210	789	852	478	766	1,385	4,270

Exports to the Common Market countries, 107,000 tons, were up 14% over 1959. Shipments to U.S.A. and Canada, 61,500 tons, declined by 12%. Exports to other overseas countries rose by 14% to 69,500 tons.

Soviet Union

1960-61 production data and Russia's mill projects

Population: 214,400,000. Per capita paper and paperboard consumption: 33.2 lbs. or 15.1 kg.
Number of paper and paperboard mills: 150. Woodpulp mills: 45; straw or other vegetable fiber mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	3,399,440	3,549,150
Chemical woodpulp	2,405,480	2,510,860
Chemical strawpulp	3,410	3,630
Mechanical woodpulp	953,920	1,057,100
Total pulp production	3,359,400	3,567,960

Principal paper grades manufactured: Newsprint, kraft bag paper, writing paper, printing paper, packaging and box paper, cigaret paper, others

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	125,070	127,600
Paper and paperboard exports	116,600	145,200
Pulp imports	70,180	90,200
Pulp exports	238,700	282,700

Principal paper and paperboard imports from: Finland, Sweden, Poland, Czechoslovakia
Principal paper and paperboard exports to: Bulgaria, Hungary, Netherlands, France, Turkey
Principal pulp imports from: Finland, Sweden, Norway
Principal pulp exports to: Great Britain, France, Spain, Hungary, Bulgaria, German Democratic Republic, Czechoslovakia

By KHANRAL DJALILOV
Editor for Soviet Union

—Moscow

THE SOVIET pulp and paper industry is successfully tackling the problems set by the 1959-1965 Seven-Year Plan, which provides for a steady increase in the output of paper, paperboard, pulp and articles thereof, an expansion in both assortment and improvement of quality of all basic products.

The main result of the past two years is that the output of primary products (paper, paperboard, and pulp) has on the whole been expanding faster than envisaged by the Plan. Paper output in 1960 was 2,420,500 metric tons (2,662,550 short tons) as compared with 2,326,500 metric tons (2,559,150 short tons) in 1959. Paperboard output grew from 763,800 to 806,000 metric tons (840,180 to 886,600 short tons). Pulp of all types increased from 3,054,000 in 1959 to 3,243,600 metric tons in 1960 (3,359,000 to 3,567,960 short tons).

The overall increase of paper and paperboard production in 1959-60 was approximately 10% over 1958. The rate of increase was relatively high in such important items as newsprint (12%), packaging board (11%), viscose pulp (14%), school copy-book paper (20%), and wall paper (25%).

Primarily responsible for the increase of pulp and paper output were the commissioning of new production capacities, modernization of equipment, and process intensification. Last year new capacities for the output of 265,000 metric tons (291,500 short tons) of newsprint and paperboard and 74,700 metric tons (82,170 short tons) of pulp went into operation, including the Krasnoyarsk pulp and paper mill in Siberia, one of the largest in the country with a capacity of 100,000 metric tons of newsprint and writing paper a year. Two new paper machines have been installed at the Kama mill and will soon start putting out 50,000 tons a year each of machine-coated paper. The Arkhangelsk, Kondopoga, Solikamsk and other pulp and paper mills have been expanded.

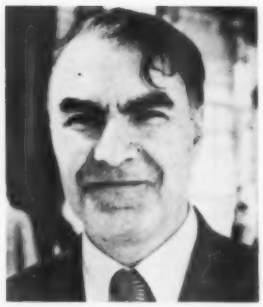
8 or 9% Increase This Year

Under the Seven-Year Plan the industry is to expand in 1961 by another 8 or 9% over the 1960 level, with paper output rising to 2,600,000 metric tons (2,860,000 short tons), paperboard to 866,300 metric tons (953,000 short tons), and chemical woodpulp to 2,484,500 metric tons (2,732,950 short tons). In some items the increase will be 10 to 15% and more. Thus, the target for newsprint output is 503,000 metric tons (553,000 short tons), an increase of 12% over last year, and 195,000 metric tons (214,500 short tons) for viscose pulp, a 24% growth.

Investments in the industry are continuing to increase. In 1960, more than 117.7 million rubles (10 rubles equals $1 U.S. or 28 equals £1 British-tourist rate) was invested in industrial expansion (exclusive of power plants and housing). This year's outlay is 196.6 million, a more than 68% increase.

By the end of the year capacities for the manufacture of 211,000 metric tons (232,000 short tons) of paper, 182,000 metric tons (200,000 short tons) of paperboard, and 250,000 metric tons (275,000 short tons) of pulp are to go into operation, among them pulp, paper and board mills in Kotlas in the North, Astrakhan in the South, and Aleksin in the centre. Erection of the Bratsk timber complex in Siberia, the Komsomolsk pulp and paper plant in the Far East, and the Selenga mill in the Buryat Autonomous Republic is progressing rapidly. The Kondopoga and Segezh mills in the Karelian Autonomous Republic and mills in other regions are being expanded.

According to estimates of the Central Statistical Board, the pulp and paper industry is keeping abreast of this year's targets.



KHANRAL H. DJALILOV, chief specialist for pulp and paper, U.S.S.R. Economic Council in Moscow. Mr. Djalilov has been serving for about two years as principal editor in Russia for this magazine. Mr. Djalilov is a pulp and paper engineer and chief adviser on the processes and equipment which are being introduced in the U.S.S.R.

New Techniques Being Used

In the technological sphere attention is concentrated on the development and introduction of soluble base liquor in chemical and semi-chemical pulping, integrated utilization of wood and tailings, intensification of cooking, grinding and bleaching, the manufacture of strong tire cord (wood base-rayon) pulp, and the modernization of paper and paperboard machines. Laboratories and semi-industrial installations are elaborating new methods of manufacturing chemical and semi-chemical pulps from reeds, straw and cottonplant stalks and the manufacture of board and paper from them.

First Mill to Use Reeds

The first stage of the first mill for the manufacture of 70,000 tons of packaging paperboard from reed pulp will go into operation this year. The design provides for three six-pipe continuous digesters which allow both sulfate and neutral sulfite cooking. A cylinder board machine with a trim width of 4,200 millimeters and a productivity of 225 metric tons of paperboard in 24 hours will be installed. It is designed to manufacture paperboard weighing from 250 to 400 (grams per square meter), but can be readjusted to produce paper base for corrugating weighing 140 to 180 g/m^2 and paperboard weighing up to 700 g/m^2.

Part of the board will be used for manufacturing cartons.

The design pays special attention to the all-round mechanization of reed cutting and transportation. Self-propelled and mounted machines are being designed to cut, bind and deliver the reeds by conveyer to trucks for transportation to 50 transfer storages

SOVIET UNION—PAPER AND BOARD PRODUCTION

Year	*Metric Tons*	*Short Tons*
1937	976,000	1,073,600
1938	982,000	1,074,200
1940	963,000	1,059,300
1946	615,000	676,500
1947	789,000	867,900
1949	1,228,000	1,350,800
1950	1,487,000	1,635,700
1952	1,850,000	2,035,000
1953	2,061,000	2,267,100
1954	2,230,000	2,453,000
1955	2,407,000	2,647,770
1956	2,581,100	2,839,210
1957	2,782,000	3,062,200
1958	2,956,500	3,252,150
1959	3,090,400	3,399,440
1960	3,226,500	3,549,150

Source: U.S.S.R. Economic Council, Moscow.

SOVIET UNION—CHEMICAL WOODPULP
(in short tons)

	Production	*Exports*	*Imports*
1957	2,163,700	220,000	90,200
1958	2,302,300	240,790	75,900
1959	2,405,480	238,700	70,180
1960	2,510,860	282,700	90,200

Source: U.S.S.R. Economic Council, Moscow.

on navigable streams. The reeds will be pressed into bales of 60-70 kg and stacked on landing stages for further shipment to the mill by barges.

A detailed description of the technology, from getting the reeds to the manufacture of pulp and paperboard, is given in an article by the chief engineer of the design, V. I. Mudrik, in last year's August issue of the (Russian) magazine Bumazhnaya Promyshlennost (Paper Industry).

In 1961, the mill will increase its annual capacity of 100,000 tons of paperboard, with an eye on further expansion to 270,000 metric tons a year, involving the consumption of some 600,000 metric tons of reeds. Another reed-processing mill is going up in Kzyl-Orda, Kazakh Republic, which will produce 140,000 metric tons of packaging paperboard a year.

It should be noted that modern methods of reed pulping for paper and paperboard are technically and economically a marked improvement on woodpulp techniques and consumption of chemicals, steam and electricity. Prime costs and specific investments are much lower for reed processing than for wood.

To Remedy Lag in Production

Soviet planning and executive authorities have lately been giving more attention to the development of the pulp and paper industry. A special decision on measures to eliminate the industry's general lag was passed last year by the Communist Party Central Committee and the U.S.S.R. Council of Ministers.

This January an all-Union conference of workers of the industry attended by leaders of the Communist Party and the Soviet government was held in the Kremlin. The conference, in which more than 1,000 delegates took part, discussed the implementation of the above decision and further practical measures for its successful realization.

Exports of paper (mainly newsprint) were largely to countries of the socialist camp—Bulgaria, Hungary, and China—and to the Netherlands, France, Turkey, Iran, and the United Arab Republic.

Pulp exports were mainly to Britain, France, Spain, Hungary, Bulgaria, the G.D.R., and Czechoslovakia.

As to imports, small quantities of pulp and paper are purchased in Sweden, Norway, Poland, Czechoslovakia and other countries, but the Soviet Union's main supplier is Finland, with which there is a long-term agreement.

As pointed out in Mr. Djalilov's article, Finland, by trade agreement is principal supplier of imported pulp and paper in Russia. In 1960, it sent to Russia 44,000 short tons of viscose pulp, 11,000 short tons of sulfite paper pulp, 57,200 short tons of paper and 38,500 short tons of paperboard. In addition, small quantities of foil paper and vegetable parchment.

The first forest maps ever made for the Soviet Union show 1,131,000,000 hectares of forest area. Over two-thirds was surveyed by air, the rest by other means. There are 100 species of trees in Russia. Coniferous species comprise 78%, soft leaf species, 16.7% and hard-leaf, 5.3%. Over 40% is larch, totalling 28 billion cubic meters and 50% of coniferous forests. Pines—15 billion cubic meters—covers 16% and spruce, 12%.

Forest lands in the U.S.S.R. are estimated to comprise 28% of the world's total forest area. Productive forests are said to cover over two billion acres, which is about four times the commercial forest area of U.S.A.

Two 284 inch Fourdrinier newsprint machines, trimming 265 inches (6.72 meters), are being built for Russia by Black-Clawson International in England. They are designed to operate at 2500 feet per minute. Hydroflyte Fourdriniers, vacuum pick up arrangement, transfer press and three main suction presses are to feature the machines. They will have totally enclosed hoods and sectional drives. One was to be delivered before next March, the other about a year later.

Walmsleys of Bury, England, recently received Russian orders for three paper machines, each 165 inches wide, for delivery in 1962-63. Also a Russian contract has been concluded with Japanese manufacturers for papermaking equipment valued at about $27,000,000. Finland also is a paper machinery supplier.

Karlstad Mekaniska Werkstad, Sweden, is supplying a complete prehydrolyzed viscose cellulose mill, in collaboration with Uddehoms AB of Sweden. KMW previously built a number of digesters for Russia. Defibrator AB of Stockholm is supplying semi-chemical pulp mill equipment with other auxiliary equipment by KMW, Waplans, Rosenblads and Jönköpings of Sweden and Lurgi AG.

Finland

With expansion, newsprint and kraft are being emphasized

Population: 4,456,000. Per capita paper and paperboard consumption: 155.9 lbs. (70.9 kg) Paper and paperboard mills: 41; woodpulp mills: 53

PRODUCTION (short tons)	1959	1960
Paper and paperboard	1,881,000	2,180,000
Chemical woodpulp	2,388,000	2,762,000
Mechanical pulp	917,000	1,089,000
Wallboard pulp	190,000	220,000
Total Pulp Production (including wallboard pulp)	3,305,000	3,851,000
	3,495,000	4,071,000

Principal paper grades manufactured: All kinds; newsprint; kraft; sulfite; book and writing; tissue; cigaret and fine; paperboard; other.

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard exports	1,520,000	1,764,000
Woodpulp exports	1,608,000	1,758,000

Principal paper and paperboard exports to: West Germany, U.K., U.S.A., U.S.S.R., Netherlands, Denmark, Belgium, France, Argentina, Brazil

Principal pulp exports to: U.K., France, Netherlands, West Germany, U.S.A., Italy, Poland, U.S.S.R., Belgium, Brazil

By NILS J. LINDBERG
Editor for Finland

—Helsinki

THE YEAR 1960 was a record year for the Finnish pulp and paper industry. The total woodpulp production was in the region of 3,500,000 (metric) tons, of which were exported nearly 180,000 tons of groundwood and about 1,420,000 tons of chemical pulp (dissolving, 152,000 tons; other sulfite, 767,000 tons, and 500,000 tons of sulfate.) Paper and board production touched 2,000,000 tons. Exports were 1,600,000 tons.

These achievements, especially in the pulp industry, were partially caused by the high rate of capacity

at which the mills were running, partially by the expansion works which are under way. During the last months of the year some new capacity had already started up.

The main part of the expansions of Kaukopää, Sunila, and Oulu sulfate mills is in use. The quite new 80,000-ton Äänekoski sulfate mill (Metsäliiton Selluloosa Oy) has started during the first quarter of 1961.

All of these enlargements and others that are to be finished later on will make the average size of the Finnish sulfate mills bigger than in any other country. This will be about 170,000 tons. On the sulfite side the enlargements are smaller and a considerable part of investments are made to increase economy and rationalization rather than capacity.

A special trend in Finland is the increase of bleaching capacity, which in the near future will bring bleached qualities of the total chemical pulp exports, sulfate and sulfite, to 50%.

Three new paper or board machines were started in 1960 and a quite new mill, the Heinola fluting mill of Oy Tampella AB, by the turn of the year. In 1961 there will be five big new newsprint machines (two of them started up in March-April). Three other paper machines were starting up in 1961.

NILS J. LINDBERG, editor for Finland, heads the technical department for the Finnish Paper Mills Association.

The fourth giant board machine of Kaukopää Mills of Enso Gutzeit Oy, was started in February this year.

Of the 15 paper and board machines included in the expansion of capacity during 1960-62, nine were ordered from Finland, four from U.S.A. and two from W. Germany.

New Research Institute

In beautiful forest surroundings, about six miles outside Helsinki, a large research center is now taking shape. The Institute of Technology and the State Technical Research Institute will eventually move all their establishments to this area.

Largest Paper Producing Companies in Finland

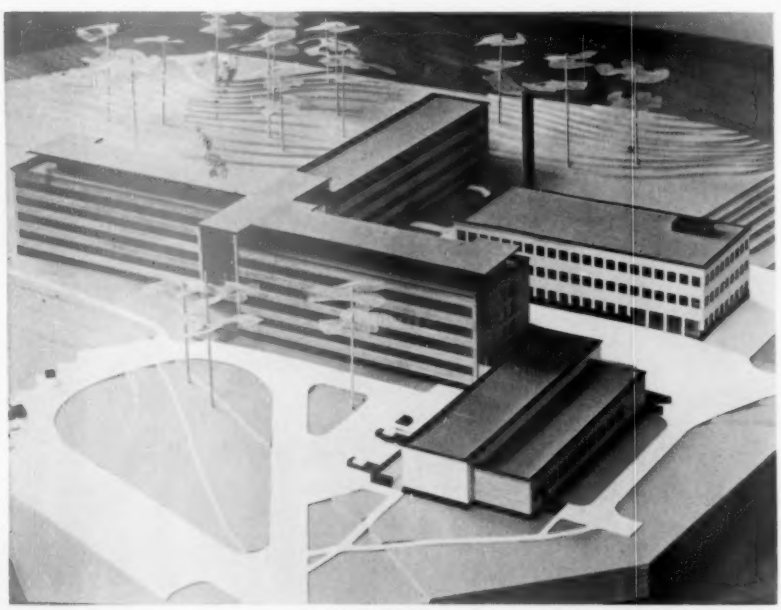
Enso Gutzeit Oy.
Yhtyneet Paperitehtaat Oy.
Kymmene AB.

Enso Gutzeit, now producing over 600,000 tons annually of paper and board (besides market pulp), is larger than the next two companies together. Yhtyneet and Kymmene are close together in production.

In the immediate neighborhood of this center, the Finnish Pulp and Paper Research Institute about two years ago purchased a lot some 25,000 sq. meters in size. The erection of the new institute buildings began a short while ago, and an accompanying photograph shows a model of them.

The total volume of the buildings is 50,000 sq. meters. The main building in the foreground contains the laboratories proper, in which the room unit is 3x6 meters. To the rear lies the administration wing, with offices and library. Here the room unit is 3x4 meters. The separate building is a pilot plant, and to the right is a low wing containing a combined lecture and staff lunchroom (200 persons) and a permanent lecture room to accommodate 60 persons.

Construction is expected to take 18 months. The decision to build this new institute has been hailed with great satisfaction by all the forest in-



FINLAND'S NEW PULP & PAPER RESEARCH INSTITUTE. This is a model of new structures, six miles outside Helsinki, new home of the institute, and a dream come true for R. Erik Serlachius, chairman of the board of directors, and Dr. Waldemar Jensen, managing director.

SERLACHIUS

JENSEN

dustries in Finland. Acknowledgments in this connection have been extended to the chairman of the board of directors of the institute, R. Erik Serlachius, who has with a never-failing interest worked for the realization of this project.

The managing director of the institute, Dr. Waldemar Jensen, has been responsible for the development of the plans.

72% of Finland is Forest

Forests cover 71.7 per cent of the total land—a higher percentage than in any other country—and their total area is the third largest in Europe (after the Soviet Union and Sweden). Reckoned per capita, the growing stock and annual growth are the greatest in Europe. Some figures:

Forest area: 53.8 m acres (21.8 m ha).

Growing stock: 1,493 m cu. meters solid measure including bark.

Annual growth: 46 m cu. meters solid measure excluding bark.

FINLAND—MECHANICAL PULP EXPORTS IN 1960

	Tons
United Kingdom	88,668
Holland	23,531
France	14,490
Denmark	5,420
Hungary	4,566
Bulgaria	3,500
Argentina	3,440
Italy	2,836
Greece	2,569
Australia	2,536
U.S.A.	2,306
Belgium	1,936
Eire	1,169
Turkey	1,158
Mexico	1,035
Israel	789
Morocco	600
South Africa	547
India	276
Switzerland	200
Colombia	197
Total	161,769

FINLAND—CHEMICAL PULP EXPORTS IN 1960

	Tons
United Kingdom	428,868
France	147,620
Western Germany	116,382
Holland	104,981
U.S.A.	99,531
Italy	77,446
Poland	56,787
U.S.S.R.	50,115
Belgium	40,781
Brazil	40,256
Denmark	29,600
Australia	25,845
Greece	22,737
Argentina	20,019
China	18,409
Eastern Germany	15,150
Switzerland	14,505
India	13,560
Czechoslovakia	12,563
Hungary	8,890
Uruguay	7,848
New Zealand	7,734
Spain	6,334
Eire	6,319
Chile	5,747
Norway	4,727
South Africa	4,330
Mexico	4,097
Egypt	3,918
Japan	2,738
Israel	2,674
Turkey	2,492
Portugal	2,218
Cuba	2,171
Colombia	1,983
Venezuela	1,978
Morocco	977
Rumania	677
Indonesia	299
Austria	19
Total	1,413,324

FINLAND—Pulp Produced

(in thousands of short tons)

	Mechanical	*Sulfite*	*Sulfate*	*Total Chemical*
1937	904	1,143	483	1,626
1949	659	690	429	1,119
1951	889	905	623	1,528
1953	877	718	530	1,248
1954	934	955	778	1,733
1955	1,013	1,096	907	2,012
1956	1,082	1,096	953	2,049
1957	1,083	1,184	1,104	2,288
1958	1 083	1,210	1,082	2,292
1959	1,107	1,181	1,207	2,388
1960	1,309	1,460	1,302	2,762

FINLAND—Pulp Exports

(in thousands of short tons)

	Mechanical	*Sulfite*	*Sulfate*	*Total Chemical*
1937	321	908	392	1,300
1949	176	495	343	838
1951	231	655	427	1,082
1953	225	511	356	867
1954	213	640	413	1,053
1955	201	750	491	1,242
1956	204	748	499	1,247
1957	182	769	523	1,292
1958	158	799	525	1,324
1959	153	849	605	1.454
1960	194	1,013	551	1,564

FINLAND—Paper Produced

(in thousands of short tons)

	News	*Wrapping*	*Writing and Printing*	*Total Paper (Includes other grades)*	*Paperboard Cardboard Wallboard*
1937	463	121	56	669	172
1949	425	107	62	623	173
1951	458	141	122	756	355
1953	484	178	123	824	332
1954	493	257	143	934	421
1955	602	299	136	968	466
1956	661	321	207	1,216	468
1957	690	348	218	1,285	572
1958	691	338	226	1,285	619
1959	715	395	220	1,387	675
1960	860	420	255	1,600	790

FINLAND—Paper Exports

(in thousands of short tons)

	News	*Wrapping*	*Writing and Printing*	*Total Paper (Includes other grades)*	*Paperboard Cardboard Wallboard*
1937	422	101	45	572	133
1949	384	67	43	502	101
1951	422	87	90	609	238
1953	443	122	94	671	206
1954	432	183	103	734	267
1955	518	213	137	881	298
1956	592	212	163	980	286
1957	607	252	169	1,046	387
1958	644	235	159	1,072	440
1959	635	304	161	1,171	470
1960	762	306	190	1,362	542

Mean annual removal: 40 m cu. meters solid measure excluding bark.

There is no justification for the fear that the present annual removal—cutting and natural losses—will exceed the annual growth, say Finnish officials. The most recent National Forest Survey (1951-53) showed that since 1944 the growing stock had increased by 9% and the annual growth by 10%.

The main tree species are pine (44% of the growing stock), spruce (36%), birch (18%) and aspen and alder (2%).

Pulpwood Costs Increase

Finnish pulpwood prices—as always during the European booms in pulp and paper manufacture—soared in 1960. By the end of the year the mills had to pay about 30% more for pulpwood than a year ago. This rise is mainly caused by the fact that Finland is a pulpwood exporting country and that the foreign buyers of Finnish pulpwood cover with these purchases a necessary margin. Over a year ago the export price (FAS) of Finnish spruce pulpwood was $8 for a piled cubic meter and in December, 1960 the corresponding price was nearly $11. The domestic price of pulpwood naturally fluctuates with the export price as the forest owners compare the prices paid by the pulp and paper industry with the prices paid by the roundwood exporters.

Enso-Gutzeit Oy., which owns and operates nine plants in Finland, with 20,000 employes, accounts for 10% of Finland's total pulp, paper and industrial exports. The Finnish corporation also produces heavy machinery. Enso-Gutzeit's sales of $120,000,000 account for more than 3% of Finland's gross national income. It sells its products in 120 countries, including the United States. More than 90% of Enso-Gutzeit's products are for export.

Finland and EFTA

The formation of the two market areas in Western Europe—the Common Market and EFTA—created a difficult situation for the non-member, non-Communistic countries.

This is particularly true as regards Finland since she is heavily dependent on foreign trade.

Since U.K. is the largest buyer of Finnish products, and, since the other three Scandinavian countries are members of EFTA, together with Switzerland and Austria, which are neutral in world politics just as Finland, this country had to seek entry into EFTA in order to avoid isolation as far as her international trade is concerned.

An agreement between EFTA and Finland regarding cooperation has now been established. The importance of this agreement is particularly to be found in the fact that it consolidates Finland's position in her main traditional markets.

In addition to this, possibilities have been created for expansion of exports, particularly pulp, paper and paperboard.

Finland's Richest Resource

For the 4½ million people who comprise the nation of Finland the forest can have but one compelling and overriding meaning; it is the perennial and inexhaustible source of the nation's livelihood, the country's most versatile and useful natural resource. And, because over 71% of Finland's extensive terrain is heavily invested with growing forest land, Finns have grown accustomed to call it Finland's "green gold."

The "green gold" of Finland's forests is the single most important and enduring basis of the economy of the nation.

Modern paper, pulp and chemical production which today forms the principal export resources, is the junior industry and its antecedents run back only a century in Finnish development. Lumber production has a historical basis in the sixteenth century.

In both fields, Finland has achieved a world marketing position which is unique for a country which is physically remote from the highways of world trade. Finland's exports, at present, supply 12% of the world demand for coniferous sawn wood; 22% of world demand for plywood; 18% of world demand for newsprint and 9% of world demand for chemical woodpulp.

Finland in 1960 exported 691,000 tons of newsprint and 430,000 tons of kraft paper, including kraft liner, against 587,900 and 395,800 tons, respectively, in 1959.

NEW SULFATE MILL IN FINLAND. Located at Aanekoski, this new 80,000 tons mill was started up in early 1961 by Metsaliiton Selluloosa Oy.

France

Imports, exports, production achieved records in 1960

Population: 45,400,000. Per capita paper and paperboard consumption: 127 lbs. (57.5 kg) Paper and paperboard mills: 306; woodpulp mills: 47; straw or other vegetable fiber mills: 6

PRODUCTION (short tons)	1959	1960
Paper and paperboard	2,575,200	2,884,056
Chemical woodpulp	634,300	755,700
Mechanical pulp	519,300	565,800
Straw or other vegetable fiber pulp	41,700	43,800
Total Pulp Production	1,195,300	1,365,300

Principal paper grades manufactured: All kinds

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	135,000	202,000
Paper and paperboard exports	131,900	208,000
Pulp imports	691,600	868,000
Pulp exports	43,500	79,500

Principal paper and paperboard imports from: Finland, Sweden, Norway
Principal paper and paperboard exports to: West Germany, Belgium, Italy
Principal pulp imports from: Sweden, Finland, Norway, U.S.A.
Principal pulp exports to: U.K., Italy, West Germany

By FERNAND PORCILE
Foreign Trade Dept.
Fédération des Syndicats de Producteurs des Papiers et Cartons Français Paris

—Paris

In regard to France's pulp and paper industry, new peak figures were noted in 1960. The most striking fact was that for the second consecutive year this nation's external trade was balanced. This gives evidence of the high level of her internal activity and of the success attained by French exporters in selling their products abroad.

An increase of 12% in paper production in 1960 over 1959 has been fol-

lowed by a 9% increase in the first quarter of 1961 over the first quarter, 1960.

Imports (valued at $4.895 million) increased by 25.8% in 1960 over the previous year, and exports (worth $4.846 million) were 25.4% higher. As French customs statistics book imports under the C.A.F. value and exports according to their F.O.B. amount, it can justly be considered that some kind of an equilibrium was again reached last year.

More French Woodpulp Made

Woodpulp output was nearly 14% higher than the previous year, thus contributing more than 60% to the overall demand. In this connection, it may be remembered that on the average, prior to World War II, local production accounted for only 43% of the total consumption.

Mechanical and chemigroundwood production increased by ca. 9% as well as unbleached sulfate, unbleached sulfite by 8.14% bleached softwood pulp by 4.5% but bleached pulp from deciduous species (hardwoods) was nearly 45% higher than the previous year.

Detailed figures accompany this article.

Of the 1,365,298 short tons produced, 69,858 tons were not used in the paper industry.

In the field of foreign trade, overall imports increased by 25.5% i.e. groundwood 1.85%, unbleached sulfite 13.5%, unbleached sulfate ca. 35% and bleached grades nearly 36%.

Imports of pulp for uses other than paper represented 98,058 short tons in 1960; in 1959, the figure was 73,716 short tons. These non-paper uses are included in the table.

Norway ranked first for mechanical pulp (54,698 short tons in 1960, 41,275 in 1959) Finland for unbleached sulfite (respective figures 59,386 and 41,960) and Sweden for unbleached sulfate (99,035 and 64,557) and bleached grades (171,867 and 137,725).

In 1960, pulp exports were 82.4% higher than the previous year: 79,512 short tons against 43,533.

Paper and Paperboard

Paper and board production increased by more than 300,000 short tons or 12% over the previous year. If newsprint very slightly decreased (−2.8%) some mills having produced a larger tonnage of publication qualities, new record figures were reached in all other main grades: printings and writings increasing by 20.3%, wrappings by 20%, thin paper and specialties by 14.3%, etc.

Imports of primary papers and boards were beyond the 200,000 short tons mark, increasing by ca. 50%: 202,040 short tons in 1960 (1959: 135,023). Main grades responsible for this increase were newsprint (89,440 tons against 59,276) and kraft paper (52,514 against 35,258).

Kraft paper was principally bought in Finland (35,550 tons in 1960, 20,111 tons in 1959) and in Sweden (12,015 and 10,708).

French exports of paper and boards were also on the upper trend in 1960. They increased by nearly 58% (franc area 29.2%–foreign countries 80%) and exceeded overall imports by ca. 6,000 short tons:

	1959	1960	%
Franc area	58,335	75,425	+29.2
Foreign countries	73,580	132,546	+80
Total	131,915	207,971	+57.7

Exports to the Common Market partners thus amounted to 96,232 short tons, representing 72.7% of the total sales to countries not belonging to the franc area or 47.6% of last year's overall exports.

As regards the franc area, main purchasers of paper and board were:

	Short tons	
	1959	1960
Algeria	28,680	37,867
Morocco	3,693	10,335
Tunisia	9,562	9,892

Taking into account the above figures, French paper and board consumption may be figured at 2,878,125 short tons, against 2,578,263 in 1959.

According to experts, during 1961 French production is likely to increase

FRANCE—160 Years of Paper

Annual Production of Paper and Board (in short tons)

Year	Tons
1800	22.000
1850	55.000
1900	450.000
1914	900.000
1938	1.289.000
1950	1,450,270
1951	1.719.950
1952	1.358.500
1953	1,576,000
1954	1.792.000
1955	1,972,850
1956	2,140,900
1957	2,318,800
1958	2,409,169
1959	2,575,155
1960	2,884,056

FRANCE—PULP EXPORTS

(in short tons)

	1959	1960
Great Britain	20,749	33,830
Italy	5,200	15,254
West Germany	4,079	10,067
Netherlands	3,235	7,024
Belgium	3,618	5,882
Switzerland	4,279	4,506

FRANCE—WOODPULP

(in thousands of short tons)

	Chemical		Mechanical	
	Produced	Consumed	Produced	Consumed
1938	148		230	
1950	261	606	320	420
1951	305	691	349	497
1952	226	510	308	396
1953	258	590	326	408
1954	311	664	369	471
1955	379	809	378	504
1956	415	815	396	518
1957	465	844	418	529
1958	533	960	454	560
1959	628	1114	519	632
1960	791	1455	566	680

FRANCE—WOODPULP SUPPLIERS

(in short tons)

	1959	1960
Sweden	318,766	367,128
Finland	153,346	189,319
Norway	67,449	83,799
U.S.A.	35,909	71,842
U.S.S.R.	47,572	52,231
Canada	17,037	30,480
W. Germany	9,058	21,533

FRANCE—OTHER PAPER AND BOARD SUPPLIERS

(in short tons)

	1959	1960
Finland	43,272	72,143
Sweden	34,474	54,214
Norway	15,086	22,291
Algeria	13,785	15,027
Canada	5,154	9,996
W. Germany	3,380	6,689
Belgium	3,950	5,543

FRANCE—PULP PRODUCTION

(in short tons)

	1960	1959	% 60/59
Mechanical and chemigroundwood	565,765	519,159	+ 8.97
Unbleached sulfite	142,681	131,938	+ 8.14
Unbleached sulfate	207,112	190,180	+ 8.90
Bleached softwood	138,859	132,855	+ 4.51
Bleached hardwood	251,083	173,401	+44.80
Bleached straw	7,850	8,914	−12.4
Bleached esparto	35,940	32,790	+ 9.60
Miscellaneous	7,008	6,065	+15.54
Total	1,365,298	1,195,302	

FRANCE—IMPORTS OF PULP

(in short tons)

	1960	1959	% 60/59
Mechanical and chemigroundwood	114,657	112,574	+ 1.85
Unbleached sulfite	156,872	138,200	+13.51
Unbleached sulfate	215,082	159,519	+34.83
Bleached grades	366,655	269,777	+35.91
Miscellaneous	14,670	11,550	+27
Total	867,936	691,620	+25.50

EUROPE

by some 7 to 8% so that paper and board output would exceed the 3 million short tons mark. With some 200,000 short tons, imports ought to balance exports providing that French prices remain steady.

Progress in 1961

The year 1961 is already showing signs of becoming one of the most active in the history of the French paper industry. Coupled with the great increase in production, building of new plants and expansion and modernization of existing mills reached impressive heights in 1960. Another notable fact concerning France as one of the world's leading pulp and paper countries is the rapidly increasing number of important uses of paper in consumer and industrial products.

A new machine at the Lancey mill of SA des Papeteries de France, located in the French Alps, completed its first full year of production of magazine and writing papers. This machine also can produce newsprint; it was supplied by Wärtsiläkoncernen (Finland). It has a trim width of 161 inches and a daily production of 130 metric tons. Machine speeds range from 820 to 1970 feet per minute.

The distinction of the Cartonneries de Pont-sur-Seine board mill at Pont-sur-Seine is that it is the first new paper mill to be built from the ground up in a new location in 28 years. It is an ultra-modern mill with a production capacity of 60 tons per day of 2.4 meters wide linerboard, made on a cylinder machine. Machinery was supplied by a number of different nations. The cylinder machine was supplied by Thiry (Belgium).

F. Béghin & Cie.'s No. 1 machine at Corbehem is undergoing an almost total rebuild by Beloit International, which should be completed soon. Production will increase on this machine from 90 to 160 tons per day of magazine and printing papers. The machine will have a trailing blade coater and cylinder. Stock for this machine will be largely from Finnish spruce with some French spruce. Béghin is France's No. 1 producer of paper and board. There are six machines at Corbehem, four for paper and two for board.

One of the many mergers involving paper companies of two countries was the move by Bowaters of London in acquiring a majority interest in two producing firms in France. Bowaters is now principal owner of Papeteries de la Chapelle S. A. of Rouen in Northern France in the manufacture of paper and of La Cellulose de Strasbourg S. A. of Strasbourg in pulpmaking. These mills together produce 235,000 tons of pulp, fine papers and newsprint annually.

"Breakthrough" in Packaging

An American businessman recently travelling through France studying the packaging of consumer and industrial goods reports:

". . . In Lyons, I found indications that something is happening . . . Lyons seems to be the place where the self-service store is beginning to make progress. The reason is that the owner of a chain of self-service stores is offering his merchandise at something slightly above wholesale prices. He can do this because he does not need all the employes that are required in the little individual stores, he can buy in larger quantities, and he can present his wares more attractively on the open shelves of the self-service store.

"Obviously, with the development of these self-service stores and supermarkets, prepackaging becomes a must and, therefore, the use for packaging processes is bound to grow."

FRANCE—PAPER PRODUCTION

(in thousands of short tons)

	Straw Paper	*Kraft, Other Coarse*	*News, Writing, Printing*	*Strawboard*	*Other Board*	*Thin Paper Specialties*	*Total*
1953	104	367	720	32	280	74	1,577
1954	125	400	822	9	338	97	1,791
1955	133	461	888	10	373	110	1,975
1956	152	515	935	12	407	120	2,141
1957	168	574	970	16	454	137	2,319
1958	189	615	1,009	12	436	147	2,409
1959	171	727	1,143	5	377	152	2,575
1960	195	827	1,260	5	421	176	2,884

FRANCE—PAPER PRODUCTION

(in short tons)

	1959	*1960*	*% 60/59*
Newsprint	506,066	491,932	— 2.8
Printings & writings	637,749	767,678	+20.3
Straw paper	170,634	195,078	+14.3
Kraft paper	251,655	256,951	+ 2.1
Wrappings & coarse	475,261	570,629	+20
Thin paper & specialties	152,268	176,127	+15.6
Straw boards	4,558	4,629	— 1.1
Other boards	376,964	421,032	+11.6
Total	2,575,155	2,884,056	+12

FRANCE—PAPERBOARD EXPORTS

(in short tons)

	1959	*1960*
West Germany	30,828	59,263
Belgium	10,793	21,129
Italy	2,866	8,688
Netherlands	1,253	7,152
Egypt	1,096	6,620
Hungary	4,145	4,482

FRANCE—NEWSPRINT SUPPLIERS

(in short tons)

	1959	*1960*
Sweden	18,575	31,145
Finland	13,363	21,022
Norway	9,832	16,141
Canada	5,154	9,996
U.S.S.R.	8,670	3,522

Norway

Mills increase capacities; soluble bases for sulfite pulp

Population: 3,587,000. Per capita paper and paperboard consumption: 180.4 lbs. (82 kg) Paper and paperboard mills: 69; woodpulp mills: 63

PRODUCTION (short tons)	1959	1960
Paper and paperboard	787,368	869,513
Chemical woodpulp	747,670	808,563
Mechanical pulp	775,588	860,702
Total Pulp Production	1,523,258	1,669,265

Principal paper grades manufactured: All kinds

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	11,502	14,326
Paper and paperboard exports	501,583	537,556
Pulp imports	39,953	49,370
Pulp exports	799,989	881,730

Principal paper and paperboard imports from: Sweden

Principal paper and paperboard exports to: U.K., West Germany, Denmark

Principal pulp imports from: Sweden

Principal pulp exports to: U.K., West Germany, France, The Netherlands

By HANS PETTER DAHM
Editor for Norway

—Oslo

THE PRONOUNCED PRODUCTION increase of 1959 continued throughout 1960 to break all previous production

records of the Norwegian pulp and paper industry. Much of the increased output was absorbed by the home market, increasing the per capita paper consumption from 75 to 82 kg (180 lbs.) a year, but the export volume also shows an impressive gain.

Prices have been fairly constant, and the 1960 export value, $180 million, was therefore only 4% higher than that of the last top year, 1957.

To cover the increasing raw material demand it has been necessary to import about one million cu. meters of pulpwood and to increase the consumption of domestic hardwood, which is now being put to large scale use by a number of sulfite mills.

To strengthen their position in the new European market situation, the Norwegian mills have worked intensively to increase productivity and product quality. Two new paper machines have been put into operation; at least two others have been ordered, and a large number of old machines have been rebuilt.

In the pulp mills, many old digesters have been replaced by new ones, mostly stainless steel clad digesters which allow operation at pressures in the 10-14 kg/sq. cm. pressure range. A very strong interest in the use of soluble bases for sulfite cooking has developed. Trial runs have been made by more than half of Norway's 16 sulfite mills. At least three mills have converted to the use of magnesium base and one is now using a two-stage ammonia base process. The reason for the conversions has been the possibility of cooking pine and the stronger pulps obtained when using soluble bases in the pH 3-4 range.

A very interesting development is the flash-drying installed at one Norwegian groundwood mill. This installation, which is the first of its kind in Europe, has been very successful.

HANS PETTER DAHM, editor for Norway. He is on the staff of the Pulp and Paper Research Institute of Norway, where he is closely involved with many new developments of the Norwegian industry.

NEWEST PULP MILL IN NORWAY—A/S Vestlandske Treforedling at Vadheim, on the West Coast. It produces neutral sulfite semi-chemical pulp for production of corrugating.

The Norwegian firm which is delivering the flash-drying equipment for the Scandinavian market, already has several orders for other groundwood and sulfate pulp drying installations.

During the year, regular production was started at the first pulp mill on the Norwegian west coast, Vestlandske Treforedling A/S, to be making semi-chemical pulp for corrugating medium from birch and alder. Two other semi-chemical mills are being built in the southern part of the country.

The Norwegian-Finnish kraft mill projected for the Arctic Ocean seaport, Kirkenes, Norway, in the far north, has been cleared by Norwegian authorities, but still awaits a final O.K. from Finland. A 60,000 ton kraft pulp and paper mill is planned, using wood from Finland.

NORWAY—Pulp Produced

(in thousands of short tons)

	Mech.	Sulfite	Sulfate	Total Chem
1937	599	527	82	609
1946	308	207	46	253
1950	590	449	84	533
1951	613	491	93	584
1952	569	454	92	546
1953	585	504	92	600
1954	708	556	95	651
1955	713	575	106	681
1956	726	547	109	656
1957	737	586	129	715
1958	712	566	137	703
1959	775	590	158	748
1960	861	634	175	809

NORWAY—Pulp Exports

(in thousands of short tons)

	Mech.	Sulfite Bleached	Sulfite Unbl.	Sulfate	Total Chem.
1937	354	298	56	30	384
1946	91	86	2	6	94
1950	344	236	6	16	258
1951	369	228	10	15	253
1952	352	212	8	16	236
1953	339	301	13	18	332
1954	423	285	12	21	318
1955	443	282	10	23	315
1956	474	271	8	17	296
1957	460	274	9	23	306
1958	415	297	8	24	329
1959	449	297	8	26	331
1960	538	309	7	34	350

NORWAY—Paper Produced*

(in thousands of short tons)

	Paper	Board	Total
1937	457	44	501
1950	474	56	530
1951	504	60	564
1952	463	52	515
1953	495	62	557
1954	551	76	627
1955	576	80	656
1956	578	74	652
1957	635	77	712
1958	633	76	709
1959	710	77	787
1960	786	84	870

*Not including wallboard.

NORWAY—Paper Exports*

(in thousands of short tons)

	Wrapping	News	Other	Board	Total
1937	100	195	62	25	382
1949	63	165	80	17	325
1950	80	158	93	30	361
1951	82	152	101	31	366
1952	52	146	62	27	287
1953	72	146	94	26	338
1954	91	149	107	44	391
1955	89	145	132	44	375
1956	89	169	101	41	400
1957	107	164	123	45	439
1958	108	164	111	41	424
1959	132	196	132	41	501
1960	136	192	165	45	538

*Not including wallboard.

The Norwegian Forest Owners Association plans to build a newsprint mill in the Trondheim-Namsos area with a beginning capacity of 100,000 tons a year, later probably increasing to 200,000 a year by installing a No. 2 paper machine.

A kraft paper machine for high quality production of six to eight thousand tons annually has been ordered for Hurum Fabriker Lövenskiold-Voekero. The largest combined paper machine in Norway (30 tons a day) has started up at AS Ranheim Papirfabrik at Trondheim.

Other recent developments include the merger of A/S Viul Tresliperi and A/S Follum Frabiker. Viul's 90,000 tons annually of groundwood permits Follum to increase newsprint production above the present 75,000 tons daily.

M. Peterson & Son A/S, Moss and Sarpsborg Papp & Papirindustri A/S have agreed on cooperation between the kraft paper and sack production at Moss and converting capacity at Sarpsborg.

A major event in Norway this year (May 29 to June 2) was the 8th Scandinavian Paper Conference, bringing together industry technicians and engineers from all four Scandinavian nations. This event is held every two years. Visits to 15 mills and two research institutes were on the program.

Finn Blikstad, technical director of A/S Borregaard of Sarpsborg, gave the principal paper on economic aspects of producing dissolving pulp and ethyl alcohol as a byproduct. Other papers were on printing of offset paper by Chr. W. Christensen of Denmark, a laboratory paper machine by Fjalar E. Moring of Tervakoski AB, Finland, and the relationships of wood, pulp and paper properties by Lennart G. Stockman of Sweden.

The U.S. Foreign Commerce Weekly reported earlier this year that there is little likelihood of further concessions for investment of foreign capital in the pulp and paper industry in Norway. A concession for a joint Norwegian-British paper mill at Sande in Vestfold county was based on an oversupply of deciduous trees in that area.

Norway's paper and paperboard exports totalled 488,000 tons in 1960, 455,000 tons in 1959 and 384,000 tons in 1958. Of the 1960 exports 18% went to Great Britain, 15% to West Germany, 7% to Denmark, 7% to Holland, 6% to Brazil and 5% to Belgium Luxembourg. Home-market sales totalled 283,000 tons in 1960 against 257,000 tons in 1959 and 243,000 tons in 1958. Norwegian imports of paper increased slightly in 1960 to 13,000 tons from 11,000 tons in 1959.

West Germany

Big gain record in 1960; output doubles in decade

Population: 55,600,000. Per capita paper and paperboard consumption: 174 lbs. (79.3 kg.)
Paper and pulp mills: 368

PRODUCTION (short tons)	1959	1960
Paper and paperboard	3,430,551	3,786,530
Chemical woodpulp and chemical strawpulp	866,304	912,160
Mechanical woodpulp	722,254	747,585
Straw or other vegetable fiber pulp	58,979	58,210
Total Pulp Production	1,647,537	1,717,955

Principal paper grades manufactured: All kinds, newsprint, kraft, sulfite, book and writing, paperboard, others

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	893,225	1,175,866
Paper and paperboard exports	86,466	115,453
Pulp imports	625,648	737,290
Pulp exports	103,646	107,955

Principal paper and paperboard imports from: Sweden, Finland, Austria
Principal paper and paperboard exports to: Netherlands, Great Britain, Sweden
Principal pulp imports from: Sweden, U.S.A., Finland
Principal pulp exports to: Netherlands, France, Austria

By DR. EMIL FISCHER
Economic Editor for German Federal Republic

—Bonn

PRODUCTION of paper and paperboard in the German Federal Republic reached a record high level of 3,786,530 short tons (more than 3,400,000 metric tons) and this was twice the production of only ten years ago. Actually, it was a gain of 356,000 short tons in the one year since 1959. This was the biggest gain made in any year since 1954, although every year has seen increases.

Despite the drawback in 1958, there was still a final gain made in that year, and there was a recovery through the whole of 1959. Then in 1960 the production gains were even better. But the income situation for the industry does not show corresponding advances and has not kept pace with the advantageous quantity results.

DR. EMIL FISCHER is our economic editor for West Germany. He has been the chief economist of the Management Association of the German Pulp and Paper Industry for many years, formerly in Berlin, now in Bonn.

WEST GERMANY—PULPWOOD

(In Thousands of Cords)

	Produced	*Imported*	*Total Received*	*Total Consumed*
1950	866	173	1,039	1,032
1951	1,088	311	1,399	1,191
1952	859	305	1,164	1,078
1953	773	235	1,008	1,168
1954	1,063	376	1,439	1,346
1955	1,025	548	1,573	1,374
1956	875	462	1,337	1,405
1957	1,028	364	1,392	1,431
1958	950	341	1,291	1,375
1959	1,055	360	1,415	1,412
1960	1,136	359	1,495	1,487

WEST GERMANY—WOODPULP PRODUCTION

(In Thousands of Short Tons)

	For Paper		*Rayon & Dissolving*	*Straw-Esparto*	*Total Chem.*	*Ground Wood*
	Sulfite	*Kraft*				
1949	343	3	97	23	466	362
1950	444	1	128	36	610	435
1951	468	1	179	46	694	506
1952	425	1	135	42	603	488
1953	445	1	170	47	663	525
1954	534	—	183	54	771	619
1955	532	—	212	54	798	662
1956	534	—	225	53	812	716
1957	533	—	243	59	835	741
1958	555	—	209	54	818	715
1959	576	—	231	59	866	722
1960	605	—	249	58	912	748

West Germany's Biggest Pulp and Paper Companies

In alphabetical order, not according to size:

Aschaffenburger Zellstoffwerke
Feldmühle Papier und Zellstoffwerke
Zellstofffabrik Waldhof

Chemical woodpulp and chemical strawpulp production has shown steady increases over the post-war years and in 1960 this total was 912,160 short tons, as compared with 866,304 short tons in 1959. Groundwood pulps showed a gain of more than 45,000 tons to 747,585 short tons.

Principal paper grades and amounts manufactured in West Germany last year were: newsprint 254,050 short tons; kraft paper, 216,186; sulfite papers, 971,744 (all sulfite pulp is imported); book and writing grades, 881,103; paperboard, 974,093, and other grades, 489,354 short tons.

Of very great importance to the German industry is the relation of imports to home production of paper and board. Imports rose nearly 300,000 short tons from 893,225 in 1959 to 1,175,866 short tons in 1960. Exports, only about 10% of the imports in the German Federal Republic, rose by 29,000 tons to 115,453 short tons. These imports were mostly from Sweden, Finland and Austria. Chemical, semi-chemical and mechanical woodpulp imports increased by more than 111,000 tons to 737,290 short tons in 1960, mainly from Sweden, U.S.A. and Finland. Pulp exports rose only 4,300 to 107,955 short tons last year.

Sweden Ships Most Pulp

—Frankfurt-am-Main

SOVIET RUSSIA shipped less than one percent of the total chemical pulp delivered to West German mills in 1960. But the 6,134 metric tons from the Soviet Union was more than twice any previous highs from that country (2,592 in 1959; 944 in 1958 and 1,076 in 1955). Virtually all Russian shipments have been unbleached sulfite (2,711 tons in 1960).

Czechoslovakia has been a slightly bigger supplier for W. Germany (7,246 metric tons in 1960, 8,075 in 1959), mostly bleached sulfite. Yugoslavia sent German mills 962 tons last year but it has had several bigger years (4,358 in 1957).

These and other interesting facts concerning West Germany's pulp trade, and pulp and paper production, are again set forth in a useful booklet published by Wilhelm Ludwig Mayer of Frankfurt, important representative of both Scandinavian and North American pulps. For a number of years, he has been compiling his booklet from official German data and distributing it free as a service to his customers. He formerly was manager of a German paper plant.

His booklet shows that Sweden

WEST GERMANY—PULP IMPORTS AND EXPORTS

(In Short Tons)

Imports

	Sulfate	*Sulfite*	*Mechanical*
1955	306,291	125,106	26,069
1956	327,431	133,772	26,784
1957	323,830	174,310	23,551
1958	327,450	157,894	26,170
1959	402,183	178,733	35,076
1960	488,727	196,773	42,388

Exports

	Bleached Sulfite	*Unbleached Sulfite*	*Straw*	*Dissolving*
1955	14,363	19,071	4,944	17,966
1956	9,593	18,469	5,239	20,739
1957	12,330	13,579	7,044	23,620
1958	18,032	19,549	5,756	31,942
1959	32,877	19,444	6,712	44,374
1960	36,249	20,619	6,237	44,602

WEST GERMANY—PAPER PRODUCTION

(In Thousands of Short Tons)

	Woodfree Book and Writing	*News*	*Kraft*	*Total Paper (Includes other grades)*	*Paper Board*
1949	35	140	123	983	407
1950	69	187	145	1,258	464
1951	64	178	157	1,438	548
1952	68	191	111	1,382	487
1953	86	223	151	1,622	548
1954	100	251	160	1,889	648
1955	101	271	178	2,059	714
1956	100	312	180	2,214	747
1957	108	297	179	2,349	786
1958	116	269	180	2,398	820
1959	130	268	197	2,553	878
1960	148	254	216	2,812	974

WEST GERMANY—TOTAL CHEMICAL PULP IMPORTS BY COUNTRIES

(in Metric Tons)

	1953		1954		1955		1956		1957		1958		1959		1960	
	tons	%	tons	%	tons	%	tons	%	tons	%	tons	%	tons	%	tons	%
Austria	23,106	7.2	49,112	12.2	53,149	11.4	57,739	11.9	63,716	11.5	58,983	11.1	60,791	9.5	53,310	7.2
Canada	3,913	1.2	12,000	3.0	15,130	3.2	10,589	2.2	10,139	1.8	13,764	2.6	22,937	3.6	37,518	5.0
Czechoslovakia	154	--	217	--	842	0.2	5,340	1.1	7,277	1.3	4,945	0.9	8,075	1.3	7,246	1.0
Denmark	--	--	20	--	--	--	--	--	417	0.1	1,177	0.2	1,394	0.2	1,741	0.2
Finland	52,424	16.4	70,314	17.5	79,901	17.1	95,172	19.6	98,785	17.8	95,657	18.0	103,596	16.2	114,590	15.4
France	1,036	0.3	923	0.2	2,117	0.5	1,044	0.2	2,069	0.4	1,820	0.3	3,295	0.5	8,652	1.2
Italy	60	--	--	--	144	--	31	--	381	--	49	--	5	--	20	--
Netherlands	2,396	0.8	4,139	1.0	5,378	1.2	6,150	1.3	5,775	1.1	5,850	1.1	5,881	0.9	5,661	0.8
Norway	28,785	9.0	30,048	7.5	27,429	5.9	25,528	5.3	28,241	5.1	24,403	4.6	23,710	3.7	23,200	3.1
Portugal	--	--	2,272	0.6	1,795	0.4	--	--	30	--	168	--	--	--	--	--
Sweden	199,175	62.4	197,220	48.9	216,119	46.2	236,001	48.6	262,634	47.4	261,948	49.3	320,219	50.0	354,960	47.6
Switzerland	10	--	272	--	100	--	481	0.1	894	0.2	914	0.2	803	0.1	141	--
U.S.A.	6,650	2.1	33,980	8.5	62,565	13.4	45,061	9.3	69,122	12.5	60,097	11.3	85,908	13.5	129,251	17.4
U.S.S.R.	--	--	--	--	1,076	0.2	587	0.1	315	--	944	0.2	2,592	0.4	6,134	0.8
Yugoslavia	779	0.3	2,250	0.6	1,557	0.3	1,383	0.3	4,358	0.8	872	0.2	176	--	962	0.1
Others	932	0.3	218	--	31	--	--	--	38	--	89	--	765	0.1	1,538	0.2
	319,420		403,085		467,333		485,106		554,192		531,680		640,147		744,924	

—Official data, compiled by Wilhelm L. Mayer

EUROPE

alone delivered 354,960 metric tons of chemical pulp and 10,862 of mechanical pulp to W. German mills in 1960, more than double the U.S.A. shipments, 129,250 metric tons (all chemical), and Finland's 114,590 chemical and 23 mechanical short tons.

Austria was No. 4 supplier with 53,310 chemical and 2,097 mechanical metric tons. Canada, all chemical, supplied 37,518 and Norway, 23,200 chemical and 22,613 mechanical. The 38,535 tons of mechanical pulp shipped into W. Germany, therefore, came almost entirely from Norway and Sweden.

In Dissolving, U.S. is First

Of the total chemical imports, 37,079 metric tons were dissolving sulfate, 35,403 from U.S.A., 1,476 from Sweden and 200 from Canada. Dissolving sulfite totaled 77,656 metric tons, with 27,762 from Sweden, 20,882 from Austria, 19,583 from Finland, 4,740 from Norway, 4,224 from U.S.A., only 96 from Canada, and 369 from other countries. Therefore, the dissolving pulp imports totaled 114,735 metric tons, as against 630,189 chemical paper pulps. U.S.A. easily led all countries in dissolving pulp shipments, which constituted about one-third of total American supplies.

Bleached sulfate, paper pulp only, totaled 179,413, of which Sweden's share was 105,165, U.S.A.'s 45,488, and Finland's 15,140. Semi-bleached sulfate totaled 79,533, with U.S.A. in front with 30,704, Finland next with 19,534, Sweden, 14,972, and Canada, 10,855. No sulfate pulps are made in West Germany.

Unbleached sulfite totaled 64,421, of which 28,815 came from Sweden, 16,831 from Finland. Bleached sulfite totaled 114,465, with 54% from Sweden, 62,065 tons; 15,743 from Austria; 14,710 from Norway; 10,380 from Finland; 5,347 from Czechoslovakia; and 3,874 from U.S.A.

The Netherlands shipped 5,404 tons of the total of 7,007 metric tons of straw and esparto pulps to W. Germany. Denmark, from its one straw mill, recently built by United Paper Mills of Copenhagen at Fredericia, shipped 1,309 tons and France, 269.

West Germany Wood Supply

Says the Food & Agriculture Organization of the United Nations:

Western Germany's imports of forest products greatly increased in the course of the forest year 1959-1960 compared with the preceding 12 months. Pulpwood imports, mainly from Finland, France, Czechoslovakia, the U.S.S.R., Poland and Yugoslavia, rose by nearly 8%.

The new trade agreement with the U.S.S.R. for the period 1961 to 1963 foresees softwood log imports of 100,000 cu.m. annually although the same quota previously agreed upon for 1960 was only partly filled. The annual quota for pulpwood and pitprops to be imported from the Soviet Union has been raised from 500,000 to 550,000 cu.m.

WEST GERMANY—FAO PRICE INDICES OF BASIC MATERIALS
(1950=100)

		Jan.-Mar.	Apr.-June	July-Sept.	Oct.-Dec.
Roundwood	1959	186	179	172	180
	1960	190	185	180	—
Sulfite	1959	131	124	124	124
Cellulose	1960	124	125	129	—

WEST GERMANY—FAO PRICE INDICES FOR IMPORTS
(1950=100)

		Jan.-Mar.	Apr.-June	July-Sept.	Oct. Dec.
Timber	1959	121	120	123	127
	1960	132	137	139	—
Mech. pulp	1959	121	120	120	118
Cellulose	1960	119	121	122	—

Greece

Major firms add machines; straw pulp mill approved

Population: 8,500,000. Per capita paper and paperboard consumption: 26 lbs. (12 kg.)
Paper and paperboard mills: 7

PRODUCTION (short tons)	1959	1960
Paper and paperboard	75,000	93,500

Principal paper grades manufactured: Kraft, sulfite, book and writing, tissue, paperboard

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports (combined)	23,000	27,500
Paper and paperbox exports (combined)	1,300	2,200
Pulp imports	60,000	77,000

Principal paper and paperboard imports from: Finland, Sweden, Canada
Principal paper and paperboard exports to: Yugoslavia, N. East Countries
Principal pulp imports from: Sweden, Finland, Canada, U.S.A.

By ALEXANDER KEFALAS

—Athens

DURING THE PAST YEAR, a rapid evolution has been observed in papermaking. Private initiative, with the State's contribution, is executing a broad program of new installations, in parallel with the de-synchronizing of the old ones, in order to meet the continuously increasing local consumption and to be able to continue the exports to the neighboring countries.

The new installations are:

The Athens Paper Mill Co., Ltd. This company collaborated with the American firm of Rice Barton Corp. and Rice Barton's affiliate in West Germany, ER-WE-PA, in the installation and start-up of a new ultra-modern machine which has a production capacity of 40 tons per 24 hours of thin paper, or 12,000 tons annually.

Paper produced on this new machine is being converted, in the same plant, into paper towels, toilet tissue in rolls and other similar products. The net result of this new machine is a 40% increase in production for Athens Paper Mill.

Paper Industry "E. G. Ladopoulos," Patras. A Dörries A. G. (Düren, Germany) Yankee cylinder paper machine was installed in March, 1961, for the manufacture of tissue and thin sulfite paper (3450 mm wide). It will have an output of 7,000 tons annually. This factory also is installing a paper machine for production of various other grades of paper including Kraft sackpaper, totalling 12,000 tons annually and multiwall bag machinery from Germany. It is planned to have this machine operating by end of 1962.

Hellenic Paper Mills, S. A. Aighion. This firm is extending its installations by placing a new paper machine built by Bertrams Ltd., Edinburgh, Scotland, operation. It will produce writing paper at the rate of 8,000 tons per year. It is expected to start up at the end of 1961 or early in 1962. This mill also plans to make Kraft sack paper.

During the past year, Prof.-Dr.-Ing. George Jayme, director of the Institute for Cellulose Chemistry at Darmstadt, Germany, was retained by the Government of Greece to assist the nation in the development of its pulp and paper industry. The main objective of his work here is the study of the raw materials situation, including the ultimate utilization of more straw and additonal reforestation to provide pulpwood.

OCHOA (Organization for Financing Industrial Development) and the firm of Parsons & Whittemore, Inc., have combined efforts on a new straw mill in Larissa, with a yearly production capacity of 12,000 tons of bleached cellulose. The machine is of Black-Clawson manufacture.

The U.S.A. Export-Import Bank on June 12, 1961, authorized a $2.5 million credit in favor of Xelotex Indus-

tries S.A., a private firm of Salonika, Greece. The loan will be used to finance the purchase of U.S. equipment to outfit a fiberboard plant, near Salonika. Total cost of the plant will be $4.2 million, which initially will have a daily capacity of 100 tons.

Five Year Plan Involves Greek Forest Development, Too

By ALEX. H. SITARAS

—Athens

1960 was a year of maintained activity for the Greek Paper Industry, on the comparatively high levels reached in the last couple of years.

About 75% of the paper for Greece is supplied by the production of the Greek paper mills, which make all kinds of paper, except newsprint. Newsprint, as well as a fairly big part of the requirements in sack kraft paper, are imported. Until now, Greece was not producing any pulp.

Several years ago it had been decided to erect a straw pulp mill in Central Greece, Larissa. This project was subsequently abandoned and the mill under erection left unfinished. During 1960, after an agreement with the Greek Government, Parsons & Whittemore Inc. has undertaken completing this mill for a yearly production of about 15,000 tons of straw pulp.

In view of the expected continued augmentation in paper consumption in Greece, estimated at about 9% yearly but also to withstand the anticipated increased competition in the Greek market for paper from the more industrial countries—members of the E.E.C.—which Greece has now joined, the Greek paper mills are aiming at increasing substantially their productive capacity. (E.E.C.—European Economic Community or Common Market—France, W. Germany, Italy and Benelux.)

The EEC Commission signed the agreement for association with the Greek Government in Brussels on March 30, 1961, after nearly two years of negotiation. The association, which will take the form of a customs union between Greece and the EEC, is intended to enable Greece eventually to become a full member of the Community. A period of transition toward the full customs union between Greece and the EEC has been established. The dismantling of internal tariffs will, in principle, be completed by both sides in 12 years, but:

1. For about one third of its imports from the Community, Greece will be allowed to stagger reductions over a period of 22 years.
2. The reductions made between the Six before the entry into force of the association agreement will be extended to Greece.

Greece will adopt the Community's common external tariff.

With capacities in range of 30,000 tons or more are the two biggest Greek mills, "EGL" E. G. Ladopoulos Paper Mill and Athens Paper Mill Co. Ltd. Next come Hellenic Paper Mill, with about 12,000 tons prior to current expansion and Papyrus Paper Mills, with 5,000 tons capacity.

Italy

Pulp and paper performance is ahead of overall industry

Population: 51,151,903. Per capita paper and paperboard consumption: 63.3 lbs. (28.6 kg.) Paper and paperboard mills: 596; woodpulp mills: 45; straw or other vegetable fiber mills: 20

PRODUCTION

(short tons)	1959	1960
Paper and paperboard	1,392,000	1,619,000
Chemical woodpulp	221,803	221,439
Mechanical pulp	255,000	294,000
Straw or other vegetable fiber pulp	64,700	80,144
Total Pulp Production	541,503	595,583

Principal paper grades manufactured: Newsprint, book and writing, paperboard

IMPORTS-EXPORTS

(short tons)	1959	1960
Paper and paperboard imports	107,301	146,607
Paper and paperboard exports	34,381	50,723
Pulp imports	458,685	571,812
Pulp exports	9,489	11,964

Principal paper and paperboard imports from: Sweden, Finland, Austria, Canada

Principal paper and paperboard exports to: Yugoslavia, Turkey, Iran, Libya, Somaliland

Principal pulp imports from: Sweden, Finland

By FRANCESCO PASTINA
Editor for Italy

—Rome

THE INDEX FOR ITALY'S overall industrial production during 1960 soared to 15.3% above 1959. This nation's pulp and paper industry demonstrated even greater vigor, with an increase of 16.3% over 1959. Of the increase, 29.2% was in paperboard and 19.3% in newsprint, while lesser percentages were recorded in other grades. In pulp, mechanical rose 15.6% while chemical showed a decrease of 10.3%.

Total 1960 paper and paperboard was 1,619,000 short tons.

Printing, Writing Papers Lead

Printing and writing paper grades were 23.8% of total production, newsprint 17.6%, wrappings 23%, strawpaper 12.4%, special grades 8.2% and paperboard 15.0%.

Italy's Big 7 in Paper

The seven largest paper manufacturing companies in Italy, in order of their size, are:

Burgo S.p.A.
Vita Mayer & Co.
Cartiera del Timavo
Verona S.p.A.
Donzelli S.p.A.
Poligrafico
Italiana S.p.A.

Newsprint production stood above 280,000 short tons, showing an increase of 19.3% above the previous year.

Of mechanical pulp output, which was 15.3% more than in 1959, 68.9% was manufactured from poplar.

Production of chemical pulp (wood and straw) for paper was 7.4% less than in 1959 while dissolving pulp showed an increase of 14.4% over the last year. Of the chemical pulp for paper, 53.4% was made from wood and 46.6% straw and vegetable fibers.

Semi-chemical pulp output was 61,020 short tons, compared to 44,900 in 1959 (35.9% increase). This was manufactured from wood (73.5%) and from straw and other vegetable fibers (26.5%).

Imports, Exports Gain

Imports of groundwood were 42,070 short tons, with an increase of 46.7% over 1959. Imports of chemical pulp for paper and paperboard were 529,851 short tons, with an increase of 23.2% and exports were 11,867 short tons, with an increase of 28.7% over 1959.

Paper and paperboard imports were

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36.6% higher than in 1959, and exports were 47.5% more.

Newsprint imported totalled 15,684 short tons, 38.6% less than in 1959.

Free Trade Imports Lead

Of the total imports of pulp, 5.7% came from Common Market countries, 57.4% from Free Trade Area and 36.4% from other countries. Major exporters to Italy were Austria with 20.7% and Sweden with 33.7%.

Of the imports of paper, 18.6% came from Common Market, 41.0% from EFTA and 40.4% from others.

Among the Italian Mills

Now under construction and scheduled to go into production next year is a 228-inch (5.8 m) newsprint machine at the Cartiera del Timavo mill near Trieste. The machine is supplied by Valmet Oy (Finland) and will be the second machine at this mill from Valmet Oy. Production will be 70,000 metric tons per year, making Cartiera del Timavo one of Italy's major newsprint producers.

Bowater-Scott Corp. Ltd. of London has established the affiliate Burgo Bowater Scott S.p.A. in a joint project with Cartiere Burgo S.p.A. The items produced in the plant at Turin will include sanitary paper products, paper towels and napkins for sale in Italy and southern Europe.

Another move involving the association of a company in Italy with that of another nation is the joining of the Reed Paper group of England with La Centrale, General Finance Corp., of Milan, a financial and industrial management firm. Under the title SICAR S.p.A., the new partnership will aim to acquire paper and board enterprises in Italy. A 150 metric ton per day carton board mill is the first projected new construction.

Other machines announced last year include one for Cartiere Burgo—a new Beloit International machine for newsprint 299 inches wide (7.6 m) with speeds up to 2950 feet per minute (900 m per min.); a 283-inch (7.2 m) wide machine for Idroelectrica del Liri; a machine from Figli de Carcano Gerolamo of Maslienico for Cartiere Valtellina (91-inches wide or 2.3 m) for making printing and writing papers; a Carcano fine paper machine for Tolmezzo (Pirelli Pneu); and another Carcano machine for Cartiera Italiana in Torino.

Uses for Small-sized Wood

—Florence

"More profitable use must be made of small-sized wood in Italy, for this relatively unused raw material could give a substantial boost to present forest economy," said Dr. Guglielmo Giordano, professor of wood technology, University of Florence, while attending a recent meeting on Utilization of Small-sized Wood in Geneva.

The special meeting, held under the auspices of the Food and Agriculture Organization (FAO), and the Economic Commission for Europe (ECE), was aimed at finding ways and means of supplying small-sized wood at an economic price to meet rising demands for wood raw materials throughout Europe.

Coppices 60% of Italian Forests

Dr. Giordano stated that coppices cover 60% of the total Italian forest area, and 12.5% of the productive area of the country. "Most of this is in hilly or mountainous regions," he stated, "while approximately two-thirds are small, privately owned woodlots, the most important species being chestnut, oak and beech."

He explained that the term "small-sized wood "generally refers to broad-leaved and coniferous wood of small dimension occurring as coppice (profuse sprouting of saplings) either on its own or amid larger-diameter growth, as stands of young trees, as newly-planted areas of forest which have been methodically thinned as branches and tops of felled trees, and as scrub resulting from unfavorable growing conditions.

He warned that a slight increase in expenses could reduce the value of standing timber to nothing. "To avoid the collapse of the forest economy in many regions, we must find suitable industrial uses for coppices hitherto used for fuel," he said. "We must reduce the cost of working operations and raise the value of the standing timber, turning low-grade coppices into other types of forest with more valuable yield."

ITALY—PAPER PRODUCED

(in short tons)

	Newsprint		Kraft Paper		Other Paper & Paperboard	
	Produced	*Consumed*	*Produced*	*Consumed*	*Produced*	*Consumed*
1938	82,687	84,362	31,972	32,028	413,437	411,182
1950	94,705	98,233	44,100	45,203	396,900	410,792
1951	115,270	117,758	60,406	63,492	454,870	408,574
1952	123,503	129,897	58,973	63,272	467,329	458,731
1953	127,600	150,920	59,400	67,100	546,700	565,440
1954	140,580	162,800	66,000	80,630	605,604	607,316
1955	157,918	180,030	86,240	92,718	652,637	643,048
1956	183,883	190,277	99,660	120,346	759,538	734,527
1957	199,280	232,980	108,130	140,250	859,828	855,226
1958	206,870	242,952	111,800	144,810	889,830	961,040
1959	139,200	262,100	104,889	153,145	1,055,600	820,000
1960	285,814	290,029	116,834	191,693	1,216,352	1,233,161

ITALY—Paper Imports-Exports

(in short tons)

Year	*Import*	*Export*
1948	28,519	17,042
1949	28,480	15,035
1950	31,911	15,316
1951	19,935	57,692
1952	27,403	24,156
1953	58,784	9,243
1954	56,557	17,994
1955	58,118	26,856
1956	56,900	25,800
1957	93,500	31,300
1958	97,400	25,020
1959	107,301	34,381
1960	166,607	50,723

ITALY—WOODPULP PRODUCTION

(in short tons)

	Chemical Pulp			
	Dissolving	*for Paper & Board*	*Mechanical*	*Total Woodpulp*
1937	0	31,010	161,766	192,776
1947	17,613	40,958	106,288	164,859
1950	48,141	96,855	140,873	285,869
1951	58,986	120,609	155,278	334,873
1952	57,332	91,701	156,726	305,759
1953	36,200	90,257	162,845	289,302
1954	64,033	97,106	163,004	324,143
1955	70,864	103,048	187,442	361,354
1956	71,708	109,080	211,000	391,788
1957	73,455	123,963	226,000	423,418
1958	58,420	133,457	237,000	428,877
1959	73,500	148,241	255,000	476,741
1960	84,163	137,976	294,260	515,699

Czechoslovakia

In planned growth program with emphasis on cellulose

Population: 13,648,864. Per capita paper and paperboard consumption: 36 lbs. (16.32 kg.) Paper and paperboard mills: 70; woodpulp mills: 13

PRODUCTION (short tons)	1959	1960
Paper and paperboard	649,254	674,223
Chemical woodpulp	568,106	620,213
Mechanical pulp	117,733	140,605
Total Pulp Production	685,839	760,818

Principal paper grades manufactured: Printing and writing, newsprint, kraft, paperboard

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard exports	72,315	75,702
Woodpulp imports	22,000	26,000

Principal paper and paperboard exports to: United Arab Republic, Great Britain, Hungary, Italy

Principal woodpulp imports from: Finland, Sweden, U.S.S.R.

By JAROSLAV HAVRÁNEK
Editor for Czechoslovakia

—Bratislava

THE SECOND FIVE YEAR PLAN in Czechoslovakia is placing great emphasis on increasing the cellulose production. By 1965 the goal is 550,000 short tons (500,000 metric tons) of cellulose. The target for 1970 is 770,000 short tons; for 1975, 880,000. Paper and paperboard production has almost doubled since 1954 but pulp production did not keep pace.

Here in the Central Research Institute of the country, possibilities of chemigroundwood production by cold soda process have been studied, with yields up to 88 to 90%. The hardwood chemigroundwood may prove a valuable substitute for classical softwood mechanical pulps. The former is found to have a greater long-fibered portion and high initial wet strength will enable newsprint to run at high speeds.

This research center combined with the Agricultural Research Institute, also in Bratislavia, for tests of ammonium base sulfite waste liquor saturated with ammonia as a fertilizer. The fertilizer was prepared in a Slovak pulp mill and results for potatoes, beans, peas, etc., were very successful. This new fertilizer probably will be broadly supplied in Czechslovakia.

Two-stage soda base sulfite cooking of beechwood is being developed here independently of a similar Swedish process on which no technical details have been published. Green chips were used here. First stage is a conventional soda base sulfite cook. The second is a 1 1/2 to 2-hour cook at higher temperatures and 7.5 to 8 pH. Viscose pulps produced were of 38 to 40% yield, 94 to 96% alpha cellulose, 20 to 40 cP viscosity and outstanding brightness. Ordinarily this is rarely achieved with beechwood.

A successful conclusion of this work will permit production of a high grade viscose pulp and considerable bleaching and other chemical savings as compared with the sulfate process.

The Cellulose Research Laboratories here in Slovakia were combined about two years ago with the Paper Research Institute of Praha (Prague) and this is now the Central Pulp and Paper Research Institute of Czechoslovakia.

Recent Mills and Expansion

One of the newer mills in Czechoslovakia is a kraft mill 35 miles north of Prague with a Karlstads Mekaniska Werkstad paper machine from Sweden.

Valmet Oy. of Finland is builder of another new paper machine for the Czechoslovak industry. One large mill for beechwood pulp is in eastern Czechoslovakia. Nearly all mills in the country have been restored or improved since the war.

JAROSLAV HAVRANEK of Czechoslovakia's Central Pulp and Paper Research Institute, who is editor for his country. He reports on technical advances.

Statistical Report

By A. B. BÁLEK

PRAHA—The 1960 paper and paperboard production reached 612,928 metric tons (674,223 short tons) as compared with 590,231 metric tons (649,254 short) in 1959.

Unbleached chemical woodpulp production in 1960 was 443,067 metric tons as compared with 412,326 in 1959. Bleached chemical woodpulp in 1960 was 120,765 metric tons; 104,135 in 1959. White and brown mechanical woodpulp, 90 per cent dry, was 107,032 metric tons in 1959, and increased to 126,000 in 1960. Paper grades only (not board) totalled 443,214 metric tons in 1960 (428,797 in 1959). (See tables for other data.)

CZECHOSLOVAKIA—PRODUCTION

Paper Grades

In Metric Tons (1=1.1 Short Tons)

	1959	*1960*
Newsprint and paper in reels	36,139	33,710
Graphic paper (thin)	5,494	5,754
Sulfite papers and sulfate papers	64,331	67,202
Printing and writing papers includes:	86,167	91,808
wood-base papers	23,190	24,187
medium quality (thin)	27,675	28,736
woodfree papers	35,302	38,885
Paperboard	161,434	169,714
Wrapping papers (usual quality)	39,057	40,962
Wrapping papers (thin)	11,504	12,200
Cigaret papers and thin papers	2,929	3,064

Austria

Advances noted in products, especially in paperboard

Population: 7,083,500. Per capita paper and paperboard consumption: 102.5 lbs (44.4 kg.)
Paper and paperboard mills: 66; woodpulp mills: 31

PRODUCTION (short tons)	1959	1960
Paper and paperboard	589,721	651,990
Chemical woodpulp	483,661	522,136
Mechanical pulp	170,446	177,807
Straw or other vegetable fiber pulp	122	—
Total Pulp Production	654,229	699,943

Principal paper grades manufactured: All kinds; newsprint, kraft, sulfite, book and writing, cigaret and fine.

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	20,996	16,239
Paper and paperboard exports	306,189	325,976
Pulp imports	41,723	33,315
Pulp exports	229,620	226,174

Principal paper and paperboard imports from: West Germany, Sweden, Finland
Principal paper and paperboard exports to: West Germany, Italy, Hungary
Principal pulp imports from: West Germany, Sweden, U.S.A.
Principal pulp exports to: Italy, West Germany, Switzerland

By DIPL. ING. G. H. SAAF-NORDEN
Editor for Austria

—Vienna

AUSTRIA'S PULP AND PAPER industry can look back with satisfaction to the production result of the year 1960. As can be seen from accompanying statistics, production has increased in all sectors as compared to 1959; in some instances the 1960 output increased quite considerably: groundwood by 4.4%, sulfite for paper by 7.8% dissolving by 6.2%, sulfate by 9.9%, paper by 8.1% and paperboard by 12.6%.

Pulp imports and paper and paperboard imports decreased by 20% each, as compared to 1959; imports were always unimportant as compared to production and exports. Pulp exports decreased only little as a consequence of the increased paper and paperboard production, paper and paperboard exports increased by 6.5%.

Also domestic sales in the individual sectors showed in 1960 in all instances a favorable increase over 1959: groundwood 51%, sulfite for paper 10%, dissolving 5%, sulfate 32%, paper 13.7% and paperboard 4.9%. Prices, in spite of various increased cost components, remained unchanged.

Income Picture Favorable

In the last year it has been possible—contrary to the development in 1959—to improve income from exports. With

EUROPE

about the same volume of pulp exports, proceeds were only a little lower than the figure of the previous year; paper exports, which increased by 3.8%, resulted in an increase of income of 7%, and paperboard exports which increased by 26.8% resulted in an increase of proceeds of 25%.

Total power consumption of the Austrian pulp and paper industry increased by 6.7% in 1960 as compared with 1959. The Austrian pulp and paper industry produces about two thirds of its power demand in its own stations; one third has to be supplied by public grid. The increase of self-produced power amounted in 1960 to about 7.3%; supply by public grid increased by 5.8%.

The fact that the increase of self-produced power was higher in 1960 than the supply by public grid—for the first time since 1956—reflects the industry's endeavors to make itself as far as possible independent from expensive public grid supply. Investments on the power sector were for this reason important, and also orders and plans for 1961 show the same trend.

DIPL.-ING. GEORG H. SAAF-NORDEN, who wrote this report on Austria, recently resigned his position as department chief of the Technical Division, Austrian Pulp & Paper Manufacturers' Association, to accept an executive position in connection with administrative and commercial management activities of Pulp and Paper Mill Frantschach. and its subsidiaries. He will be in central offices of the firm in Vienna. Born in Baden, Switzerland, where his father was director of Brown Boveri & Co., Ing. Saaf-Norden was with the Austrian association since 1947, and was consultant and advisor on several major projects in his country.

Pulp Expansion Is Difficult

In the field of pulp plant progress Austria continued its program which has been in effect since 1945. Mostly the program consists of modernization and technical improvement of existing pulpmaking facilities. The difficult wood situation in Austria does not permit any great expansion in this field.

A new high yield sulfite plant (Bauer refiner with bleaching tower) will go into operation in 1961. A number of bleaching plants will be improved by additional bleaching stages, and a completely new sulfite bleaching plant will start up in 1961.

On the paper production sector, numerous stock preparation plants were and still are being renovated and improved. Three new paper machines went into operation in 1960, another started operation early in 1961, and two more paper machines are expected to begin operation in 1962. Numerous paper machines were and

AUSTRIA—PAPER AND BOARD PRODUCTION
(in short tons)

Year	Newsprint	Book Paper	Wrapping Paper	Fine & Special	Paperboard
1937	69,718	117,326	57,475	10,791	70,510
1950	78,316	101,661	66,162	16,602	64,039
1951	83,964	110,081	73,096	20,341	74,568
1952	82,037	109,628	62,946	22,266	70,084
1953	92,249	133,901	71,866	28,323	68,804
1954	116,166	151,754	100,905	32,883	85,196
1955	136,833	159,988	102,179	37,085	93,624
1956	176,515	158,000	102,000	27,000	93,038
1957	145,816	170,096	115,414	44,061	101,688
1958	154,076	158,742	115,759	43,511	100,587
1959	151,270	167,486	126,382	46,874	98,810
1960	151,636	185,915	150,915	52,203	111,321

AUSTRIA—PULP PRODUCTION
(in short tons) bone dry

Year	Sulfite	Dissolving	Sulfate	Mechanical
1937	255,453	13,893	24,948	106,436
1950	209,129	42,096	23,816	102,672
1951	215,557	58,711	25,694	116,276
1952	209,509	48,947	25,066	108,043
1953	237,213	49,828	37,340	126,378
1954	267,366	59,534	81,829	152,243
1955	283,473	65,870	95,055	163,279
1956	282,000	66,000	97,000	186,131
1957	292,779	75,736	103,995	174,677
1958	294,375	77,691	100,227	168,843
1959	296,089	84,739	102,954	170,446
1960	319,102	89,988	113,046	177,807

AUSTRIA—PAPER AND BOARD EXPORTS
(in short tons)

Year	Newsprint	Book Paper	Wrapping Paper	Fine Paper	Paperboard
1937	61,972	31,867	29,148	5,955	35,970
1950	48,522	51,715	15,301	8,599	13,889
1951	51,533	54,704	18,484	9,530	18,777
1952	54,124	50,093	11,023	13,624	13,845
1953	60,981	81,690	20,304	19,546	22,752
1954	83,088	90,581	36,594	20,931	29,373
1955	101,879	97,761	32,916	23,671	28,523
1956	140,593	88,000	30,000	16,000	30,185
1957	106,417	99,063	38,988	27,902	27,409
1958	98,857	107,797	37,100	19,843	34,326
1959	71,197	137,362	36,723	30,885	27,133
1960	79,086	127,032	49,785	36,911	33,161

AUSTRIA—PULP EXPORTS
(in short tons) bone dry

Year	Sulfite	Dissolving	Sulfate	Mechanical
1937	136,423	12,737	10,340	20,669
1950	87,052	11,905	8,963	6,391
1951	70,253	18,016	9,457	6,106
1952	71,329	11,450	7,020	5,255
1953	84,161	19,451	13,278	9,483
1954	87,657	24,490	34,259	4,937
1955	92,667	25,119	46,576	8,210
1956	98,000	33,000	46,600	8,192
1957	97,077	34,388	43,229	12,264
1958	121,079	35,858	53,954	8,258
1959	126,281	40,582	50,510	12,220
1960	128,873	44,321	42,132	10,849

Ten Largest Austrian Paper Companies

	Capacity-Metric Tons Paper and Paperboard
Neusiedler AG (16 mills)	63,000
Murztaler Holzstoff und Papierfabrik AG	56,000
Nettingsdorfer Papier und Sulfatzellulose-Fabrik AG	51,000
Steyrermühl Papierfabriks und Verlags AG	41,000
Leykam-Josefshal AG	
"Arland" Papier und Zellstofffabriken AG	34,000
Kartonfabrik Franz Mayr-Melnhof & Co.	30,000
Papierfabrik Frohnleiten Carl Schweizer A.G.	26,000
Bunzel & Biach A.G. (3 mills)	25,500
Guggenbacher Papierfabrik GmbH	21,000

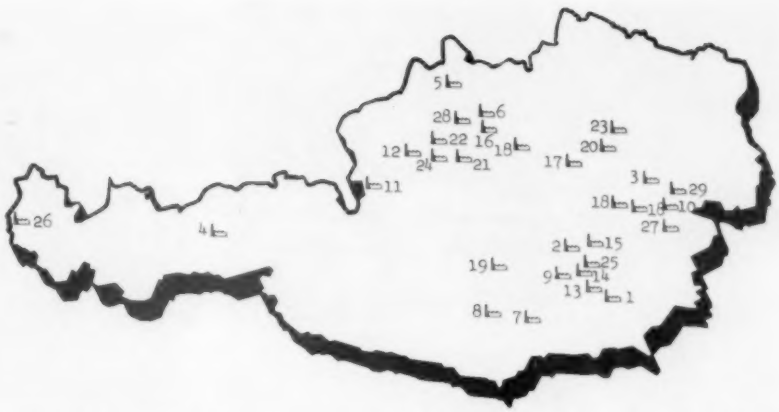
still are being completely rebuilt.

While the paperboard industry intensified its endeavors for rationalization, a new Raywood automatic plant was put into operation.

Improving Education Program

The endeavors of the Austrian pulp and paper industry for improved training and education of its apprentices, which in 1959 led to the opening of an Apprentice Home of the Austrian pulp and paper industry, continue in all sectors of this field. At present, introduction of a 6th annual course on college level—specialized for pulp and paper—is being discussed with the pertinent state authorities. There are also efforts being made for a reorganization and specialization at the university level. It is hoped that both projects will be realized before 1962.

Austria's pulp and paper industry strives incessantly on all sectors to activate its strength within the frame of its possibilities, in order to assure job security for its workers and employes and to satisfy future domestic demands for quantity and quality of product and also to try to favorably influence Austria's balance of trade by important exports. (The Austrian pulp and paper industry is, after the iron and steel, forestry and the tourist industries, the largest Austrian provider of foreign currency.) Even if constantly rising costs represent a heavy burden for the largely export-oriented pulp and paper industry and although raw material difficulties constantly increase it is still hoped that the pulp and paper industry will be able to enlarge its activities within the larger economic spaces.



MILLS OF AUSTRIA—Shown on map: 1, Arland; 2, Brigl & Bergmeister; 3, Bunzl & Biach, Ortmann; 4, Bunzl & Biach, Wattens; 5, Crollwitz-Obermuhl, Reinhold & Co.; 6, Dr. Franz Feurstein K. G. Erste; 7, Frantschach; 8, Adolf Funder; 9, Guggenbacher; 10, W. Hamburger; 11, Kellner-Partington; 12, Lenzinger; 13, Leykam-Josefstahl; 14, Franz Mayr-Melnhof & Co.; 15, Murztaler; 16, Nettingsdorfer; 17, Josef Greinert; 18, Neusiedler; 19, Polser; 20, Rennersdorf; 21, Rittmuhle, Joh. Woiczik; 22, Steyrermuhl; 23, Matthaus Salzers Sohne; 24, F. Schuppler; 25, Frohnleiten, Carl Schweizer; 26, Ganahl & Co.; 27, H. Walli; 28, Welser; 29, Wiener Neustadter.

Poland

Production quotas met; 11 new machines planned

Population: 29,731,000. Per capita paper and paperboard consumption: 47.1 lbs. (21.2 kg.) Paper and paperboard mills: 60; woodpulp mills: 9; straw or other vegetable fiber mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	646,300	705,300
chemical woodpulp/b.d./	285,800	321,300
Mechanical pulp/b.d./	175,700	180,000
Straw or other vegetable fiber pulp/b.d./	3,700	4,100
Total Pulp Production /bone dry/	465,200	505,400

Principal paper grades manufactured: All kinds

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	28,400	34,400
Paper and paperboard exports	41,800	44,100
Pulp imports/b.d./	65,800	73,000

Principal paper and paperboard imports from: Finland, Sweden

Principal paper and paperboard exports to: West Germany, India, U.S.S.R., Belgium, Spain

Principal pulp imports from: Finland, Sweden, Austria, Norway

By PROF. EDWARD SZWARCSZTAJN
Editor for Poland

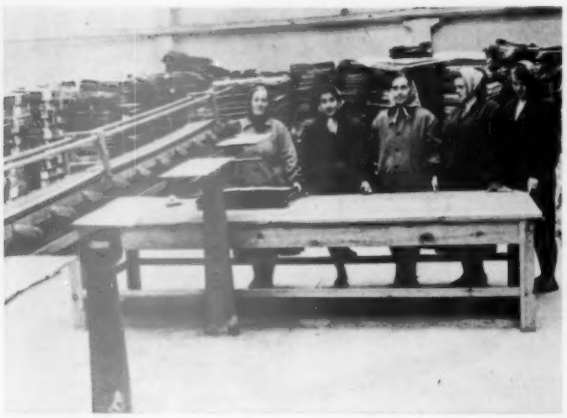
—Lodz

THREE NEW Black-Clawson machines with Millspaugh press sections were installed in one of the Polish mills during the year 1960, a year which saw the Polish pulp and paper industry fulfill the quotas which were set for it. Each machine is 168 inches wide (trim width). The No. 1 machine manufactures bag paper. Nos. 2 and 3 are producing wrapping papers. Actual expanded capacity of the new paper mill is about 75,000 short tons.

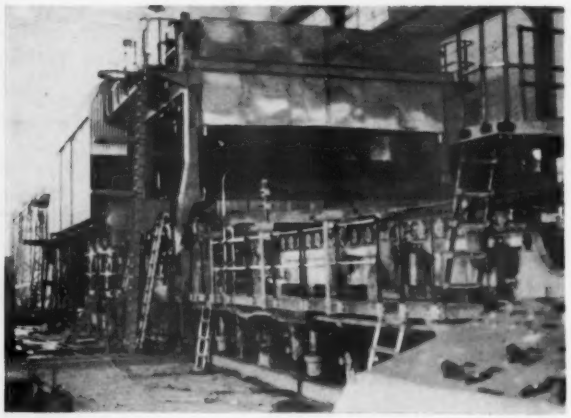
PROF. EDWARD SZWARCSZTAJN, editor for Poland, is director of the pulp and paper technology department of the Lodz Technical Institute and also president of the Polish Paper and Cellulose Technical Association.

Now Black-Clawson and Millspaugh and other British manufacturers are building a fourth machine and auxiliaries for this mill in Ostroleka, northeast of Warsaw.

The converting departments are: a 100-million-bag plant with German equipment and a 35,000-ton Langston (U.S.A.) corrugated and container plant. A modern sulfite liquor alcohol plant, with a yearly capacity of 1,300,000 gallons of 100% alcohol, was brought into operation in the Niedomice dissolving pulp mill.



FEMALE CREW ready for action at the carry-off end of one of the two S & S (USA) gluers in the container plant at Ostroleka.



ONE OF THREE BLACK-CLAWSON MACHINES, each 168 inches wide, at Ostroleka, with Carrier-Ross aluminum hoods.

Pictures taken in visit to Poland by A. W. Wilson, editor of PULP & PAPER and editorial director of PULP & PAPER INTERNATIONAL:

TOP PRODUCTION EXECUTIVES OF ENTIRE POLISH PAPER INDUSTRY: Jerzy Olejniezak (left) technical director, and Henryk Pawlowski (right), who rose from worker's ranks to top position of managing director.

POLAND—PULP AND PAPER PRODUCTION

	(in short, tons, bone dry) *1959*	*1960*
Sulfite unbleached	84,300	85,400
Sulfite bleached	54,000	54,900
Sulfite dissolving	37,300	38,200
Kraft unbleached	90,200	117,800
Kraft bleached	16,300	20,900
Straw bleached	3,700	4,100
Total chemical pulp	285,800	321,300
	(short tons) *1959*	*1960*
Newsprint	82,800	84,900
Book paper	88,200	92,500
Writing paper	70,300	74,400
Wrapping paper	152,000	165,700
Bag paper	65,000	86,100
Other paper	44,700	51,600
Total paper	503,000	555,200
Paperboard	143,300	150,100
Total paper and paperboard	646,300	705,200

The year 1961 begins a new Five-Year-Plan which is designed to bring Poland's production in 1965 to:
425,000 tons chemical pulp (b.d.)
920,000 tons paper and paperboard

Expected paper and board consumption is about 60 pounds per inhabitant.

Expansion Programs

Eleven new paper machines will be erected in existing and new mills. The biggest mill in the country will be Swiecie on Vistula River with final capacity 150,000 tons dissolving and kraft pulp, as well as 370,000 tons of corrugating, wrapping, bag paper, testliner, kraftliner and box board. Stage I of this mill is to start early in 1965.

Other principal investments in the 1961-1965 Five-Year-Plan are: 78,000 tons/year kraft pulp plant and the No. 4 paper machine for corrugating (fluting) and wrapping grades in Ostroleka; two straw and reed pulp plants (14,000 tons each) in Wloclawek and Szczecin mills; three machines for fine and special papers in Zywiec; two machines for writing and wrapping grades in Kostrzyn kraft pulp mill; one 26,000 tons/year box board machine in Jeziorna mill, starting in 1961. This machine was built by the Polish Paper Machinery Works "Fampa" in Cieplice.

Plans for further considerable expansion of Poland's pulp and paper industry are in preparation. The most important problem to be solved consists in securing necessary raw material resources.

Great efforts will therefore be made to develop pulp and semi-chemical production from straw, reed, all kinds of wood wastes, from the country's beech wood reserves and from widely now established poplar wood cultures.

The expansion completed in Poland in the past few years, especially at Ostroleka, has been described by visitors as the greatest in Eastern Europe.

The Netherlands

Million ton mark passed for new production record

Population: 11,500,000. Per capita paper and paperboard consumption: 185.2 lbs. (84.2 kg.)
Number of paper and paperboard mills: 40; woodpulp mills: 2; straw or other vegetable fiber mills: 3

PRODUCTION (short tons)	1959	1960
Paper and paperboard	1,033,047	1,122,829
Mechanical or ground-wood pulp (Including wet lap)	126,500	140,228
Straw (for market only)	56,100	58,300
Total pulp (includes consumed and sold)	564,300	601,128

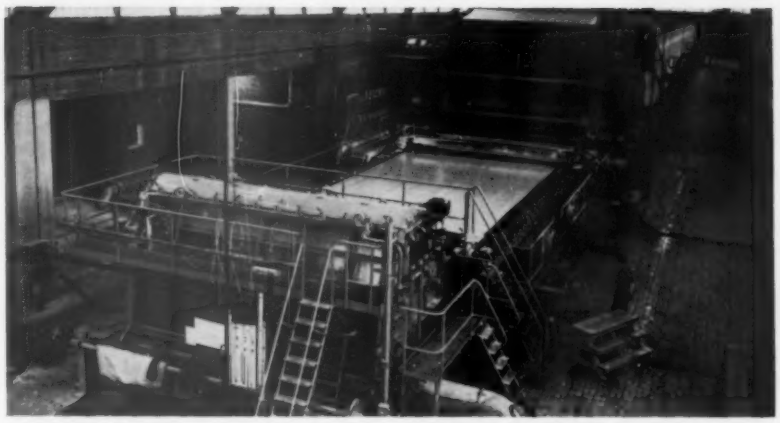
Principal paper grades manufactured: All kinds.

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	282,700	346,500
Paper and paperboard (including strawboard exports)	160,600	172,700
Strawboard exports	210,100	220,000
Pulp imports	284,900	353,100
Pulp exports	396,000	440,000

Principal paper and paperboard imports from: Benelux, W. Germany, France, Sweden, Finland, Austria, U.S.A.
Principal paper and paperboard exports to: Benelux, W. Germany, France, Britain.
Strawboard exports to: W. Germany, Benelux, Italy, France, Britain.
Principal pulp imports from: Finland, Sweden, Norway.
Principal pulp exports to: Benelux, Britain, France.

"Big Three" in the Netherlands

These are the three biggest companies in Dutch papermaking:
Van Gelder Zonen
Berghuizer Papierfabrik
Konenlijke Nederlandse Papierfabriek



PAPER MACHINE NO. 21 at the Velsen Mill of Van Gelder Zonen, the largest pulp and paper company in The Netherlands. At Velsen, this company operates a Papermakers' School, open to boys with an elementary education.

By HENK VOORN
Editor for Holland

—Haarlem

IN THE YEAR 1960, the Dutch paper and board industry surpassed a production of one million metric tons. The paper industry produced 654,754 metric tons (720,225 short tons), an increase of 10.6% over the 1959 figure. The strawboard industry produced 362,000 metric tons (398,200 short tons).

Production increases in the various groups of papers showed the following results: newsprint gained 10.6%, wrapping papers 9.2%, woodfree writing and printing papers 12.6%, woodcontaining writing and printing papers 15.6%. The group of "other and special papers" gained only 3%. As this group lost 3% in the preceding year, production in this group has now only reached its former level.

The year 1960 was profitable for Dutch papermakers and the leading companies published annual reports which reflected their satisfaction with the good results of the past year, and their trust in a good outlook for 1961.

As far as is known at this moment, results in the first quarter of 1961 have not been below expectations.

The ever-increasing activities of the Dutch printing industry in the export market is a big help to the paper industry, and the production of wrapping papers and boards is strongly stimulated by self-service retail stores in American style, which now have definitely conquered the field of retail selling.

Much New Equipment Coming

Practically all mills are building or planning to build new equipment or are modernizing existing equipment. A capacity increase of about 10% will be available next year. Among the more important additions to the mills may be mentioned a new machine for machinecoated paper to be installed at the K.N.P. (Royal Dutch Paper Mills). In 1962, this machine will be ready for production.

HENK VOORN is editor in The Netherlands. He is editor of his country's paper industry magazine, "De Papierwereld."

Also the Export Papierfabrik, producing tissues, toilet paper and specialities, is building a complete new mill for an annual production of 40,000 metric tons with possibilities to increase this figure to 80,000.

The Gelderland Paper Mill is acquiring for its second mill another Italian Fourdrinier machine, and the wrapping paper mill Coldenhove at Eerbeek built and put into operation a new mill in the spring of 1961. An important modernization and new equipment at the Gennep paper mill also started production in the spring of 1961.

Papermill De Hoop at Eerbeek will be the first Dutch mill to make semichemical woodpulp. A Pandia cooking unit has been ordered from Black-Clawson International and in 1962 a production of 15,000 tons annually will be reached. Also the Paper Mill Doetinchem and Vereenigde Papierfabrieken at Eerbeek installed new papermachines, which will start production in 1961/1962.

Increased Woodpulp Imports

The growing production in the Netherlands is reflected by growing imports of woodpulp. In 1959, 250,000 tons of cellulose were imported, in 1960 this figure reached about 300,000 tons.

THE NETHERLANDS—PRODUCTION
(metric tons)

	1957	*1958*	*1959*	*1960*
Newsprint	131,334	126,314	130,890	145,488
Wood-cont. writ. & print.	49,783	57,178	64,218	74,109
Woodfree writ. & print.	93,327	89,571	103,064	115,586
Wrapping paper/board	211,346	219,250	258,784	283,189
Others and specials	34,176	36,402	35,178	36,381
Total	519,966	528,715	592,134	654,754

East Germany

Industry largely centers in Heidenau industrial region

Population: 18,200,000. Per capita paper consumption: 92 lbs.

PRODUCTION (short tons)	1959	1960
Paper and paperboard	780,000	867,000
Chemical woodpulp	390,000	412,000
Mechanical woodpulp	296,000	350,000
Straw or other vegetable fiber pulp	50,00	50,000

IMPORTS-EXPORTS (short tons)	1959	1960
Woodpulp imports	45,000	45,000

Principal paper exports to: Berlin, U.S.S.R., Bulgaria

EUROPE

—Heidenau

THIS AREA, near Dresden, is the "homeland" of the pulp and paper industry of the German Democratic Republic and technological and research facilities and the general headquarters and direction of the industry are located here.

In Leipzig is the Institute for Graphic Technics and much successful work has been carried out there to establish means of evaluating and measuring the qualities of printing papers in many ways, including the interaction of inks. The Leipzig Fair, each year in the spring, draws many Europeans in the paper and printing fields, and these exhibits were again an important part of this year's Fair.

A Five Year Plan to increase paper production to about 180% of the 1955 figure of about 700,000 tons is under way and goals are to be reached in 1965 under this current Plan.

There is great interest in developing straw and reed pulping industries. At present straw pulp capacity of 50,000 tons is produced with new chemical plants (20,000 tons) and by old semi-chemical methods (30,000 tons).

The only German sulfite pulp mills exist in East Germany (none are permitted in West Germany). There are also kraft mills and semi-chemical mills and bleaching. Fir, birch and poplar are being utilized here.

Berlin, with its large population, is an important market for paper made in East German mills. In construction of new mills, nearness to Berlin is an important consideration for this reason. A newsprint and printing paper mill in that region would send about half of its production to Berlin, about 30% for domestic use and 20% for export.

Government authorities must decide mill locations because of the water supply problems. New production under consideration would include photographic paper, packaging papers, condenser papers and cigaret and transparent paper.

Use of Reeds

Dr. H. P. Iwanow, and other technical experts, have made extensive studies of the fast growing giant river reeds of eastern countries of Europe, Italy and China. Cellulose content was highest in Chinese (59%), Rumanian (49%) and Italian (42%) reeds. In East Germany it is 34%. Lignin is highest in the East German reeds, 36%.

He reported the development in this country of a new machine for improved cleaning of straw or reeds of dust and foreign matter, to make them more valuable as a pulping raw material. Top liner for corrugating board has been made with 60 kgs. of reed pulp to 300 kgs. of waste paper, and under side with 40 kgs. of reed pulp, 200 of waste paper, 60 of woodpulp and 80 of straw pulp. Writing paper was made with 74% reed and offset with 60%.

Leipzig Fair

At this year's Leipzig Fair, machines for paper and printing were again shown in the BUGRA-Messehaus on a floor space of more than 35,000 sq. ft. Czechoslovakia, Great Britain, France, Italy, Switzerland and West Germany were among exhibitors. Paper and printing machines from the Soviet Union were on display in the Fair Hall of the Soviet Union.

For papermaking, VEB Papiermaschinenwerke, Freiberg, exhibited a newly-developed slow stuff separator with continuous dirt removal. The effective separation of impurities enables the production of superior paper and protects the machines from excessive wear.

DR.-ING. ERNST GIESE, technical director of research and development for the East German pulp and paper industry, has his headquarters in Heidenau. He is the editor in his country for this publication.

Switzerland

Increases in production are noted, but imports up, also

Population: 5,411,000. Per capita paper and paperboard consumption: 195 lbs.
Paper and paperboard mills: 36; woodpulp mills: 3

PRODUCTION (short tons)	1959	1960
Paper and paperboard	468,000	529,000
Chemical woodpulp	97,257	111,331
Mechanical pulp	120,750	115,468
Total Pulp Production	218,007	226,799

Principal paper grades manufactured: Newsprint, kraft, book and writing, paperboard, greaseproof, fine special

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	22,000	26,700
Paper and paperboard exports	12,900	13,607
Pulp imports	79,850	106,998
Pulp exports	16,335	21,450

Principal paper and paperboard imports from: West Germany, Sweden, Austria, Finland
Principal paper and paperboard exports to: West Germany, France, Italy, Netherlands
Principal pulp imports from: Sweden, Austria, Finland, Canada
Principal pulp exports to: France, Italy, West Germany

EMILE EGGER, NOTED SWISS ENGINEER, of Cressier, Neuchatel, Switz., designed this impressive large three-section graphic panel for complete automatic control of variable stock preparation for a new No. 5 Escher Wyss Fourdrinier machine at Cham Paper Mills in Switzerland. Eight Escher Wyss refiners, two Escher Wyss deflakers and three Reisten beater mills are ahead of the machine.

By SIEGFRIED H. AESCHBACHER
Editor for Switzerland

—Balsthal

THE YEAR 1960 was a successful one for the Swiss pulp and paper industry, with increases in all categories. Imports also were rising, and the industry is somewhat concerned with the effects for Switzerland which will result from joining as a member of the European Free Trade Association. The Swiss industry must anticipate greater competition from her new EFTA partners, which include the Scandinavian countries and Austria. As is well known, these are important exporters of pulp and paper.

Production in Switzerland increased from 468,000 short tons in 1959 to 529,000 short tons of paper and paperboard. In chemical woodpulp, Swiss mills increased production from 97,257 to 111,331 short tons.

There are excellent pulp and paper mills in Switzerland and, while it is not a big industry in relation to other countries, it provides employment for 6,174 men workers and 1,165 women.

Paper and paperboard imports rose from 20,000 metric tons (22,000 short tons) to 24.300 metric tons (26,700 short tons) from 1959 to 1960. Of these imports, 22% came from West Germany, 18.9% from Austria, 11.8% from Finland and 11.3% from Sweden. Woodpulp imports rose from 53,947 metric tons (about 60,000 short tons) to 73,667 metric tons (about 80,000 short tons). As the effects of the new EFTA membership and continued tariff reductions by EFTA member countries are accelerated, the imports will be of increasing importance to the Swiss mills.

In the past year, there were no important price movements for paper and paperboard, although the prices have slowly moved downward.

The higher import rate has been a first reaction to the lower duties within the countries of the European Free Trade Assn. The efforts to unite the two European trade blocs (EEC and EFTA) have so far been without success and in Switzerland there seems to be little hope that this can be effected easily or for a very long time.

There were no additional machines set up during 1960, as there had been in 1959, but new improvements and replacements in older units took place.

Considering the continuously rising consumption trend for paper, the outlook generally is good for the future. This is due, in large part, to general good condition financially and basic facilities of the Swiss paper and pulp industry.

It is interesting that Switzerland maintains a sulfite pulp export market. Two of its mills make a high quality of sulfite market pulp. It is sold domestically and abroad. For a small country, pulp exports of 21,450 short tons is rather significant.

In several Swiss mills there are new machines of the last year or two and they come from several manufacturers. New Beloit machines, two since the war, are at the Balsthal mill where Mr. Aeshchbacher is general manager. A Voith machine at Papierfabrik Perlin, a new Dörries machine at the Deisswil board mills, their 5th from that German company; an Escher-Wyss machine at Cham Paper Mill, a Wärtsilä machine from Finland for newsprint at Utzenstorf are among the more recent additions. At Attisholz there is a new 8-stage bleach plant and air-borne pulp dryer from Svenska Fläktfabrikken.

SIEGFRIED H. AESCHBACHER has for several years written the annual reports on Switzerland for this magazine. He is president and general manager of the Balsthal mill and during his career has managed two of Switzerland's important mills. His report on Switzerland always has been distinguished because of his broad point of view.

Spain

Pulp production slightly higher but paper and board down 4%

Population: 30,128,056. Per capita paper consumption: 26.4 lbs.
Paper and paperboard mills: 256; woodpulp mills: 29; straw or other vegetable fiber mills: 68

PRODUCTION (short tons)	1959	1960
Paper and paperboard	374,000	360,000
Chemical pulp	50,000	48,000
Mechanical pulp	73,000	74,000
Straw or other vegetable fiber pulp	49,000	52,000
Total pulp	172,000	180,000
IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	17,500	16,300
Pulp imports	117,000	100,000
Paper and paperboard exports	2,860	4,500

Principal grades made: All kinds
Principal paper exports to: Cuba, Philippines, India
Principal paper imports: Sweden, Canada, Finland
Principal pulp imports from: Sweden, Norway, Russia

By JOSÉ LUIS ASENJO MARTÍNEZ
Editor for Spain—Madrid

—Madrid

PULP PRODUCTION in Spain during 1960 made small advances as it did in the preceding two years. Paper and paperboard production, however, was down some 14,000 short tons. Production in 1959 rose 12%, but dropped this year by 4%.

The industry attributes this to restrictions under a national stabilization program, stocks carried over unsold from 1959, and a weakened demand. The picture brightened toward the end of 1960 and sales for the first term of this year have reached normal volume, though returns still are low. Wood pastes have been maintained at 66,000 metric tons in mechanicals and 42,000 in chemicals. Esparto grass paste production has grown to 19,000 from 14,000 metric tons.

The Ten Largest Paper Producers in Spain

Listed in order according to 1959 profits tax payments:

La Papelera Española S.A.
Papelera Godó S.A.
Papeleras Reunidas S.A.
J. y. F. Torras Hostench S.A.
Celulosas del Nervión S.A.
La Montañesa S.A.
Papelera Guipuzcoana de Zicuñaga
Echezarreta S.A.
Miquel y Costas & Miquel
Papelera del Araxes S.A.

SPAIN—PAPER PRODUCTION
(In Short Tons)

	Fine	*Tissue*	*Newsprint*	*Kraft*	*Paperboard*	*Printing Paper*	*Total (inc. other grades)*
1949	10,397	1,653	19,536	4,762	23,686	96,631	156,665
1950	12,429	2,205	22,020	5,179	29,038	117,317	189,292
1951	13,115	2,415	25,270	6,100	32,500	122,350	201,750
1952	13,410	2,750	25,550	10,536	36,448	123,957	212,648
1953	15,378	1,663	23,166	11,743	55,352	85,064	200,323
1954	15,080	3,540	34,475	19,430	34,742	147,107	254,374
1955	14,520	5,720	36,562	24,220	40,832	102,300	256,740
1956	15,730	3,300	40,150	31,680	44,000	120,000	286,880
1957	19,615	4,000	44,611	36,128	49,170	121,624	310,200
1958	20,600	4,200	46,700	39,000	57,600	117,600	335,000
1959	19,000	4,300	58,500	44,000	57,000	113,000	375,000
1960	16,000	4,000	65,000	46,000	42,000	103,000	360,000

JOSE LUIS ASENJO MARTINEZ is editor in Spain. He is economist and sub-director for "La Papelera Espanola, S.A.," the largest paper company in Spain.

Imports—excepting cellulose pulps bought for non-paper purposes—were 70,000 metric tons, similar to 1959.

During 1960, pulp imports were permitted only from countries which were full-members or part members of the OCDE (Scandinavia, U.S.A., Canada). Beginning in mid-March of this year, these imports were completely liberalized, eliminating fixed quotas.

Paper production tonnage reductions appear principally in ordinary writing paper, fine cardboards and cardboards. Press, writing, silk and strong packing papers have been maintained at about the same tonnage. National press paper production has grown some 10,000 metric tons, and has now leveled off at 65,000 tons because of continuous demand.

Work is still underway at the three factories which the state National Industry Institute is installing at Pontevedra, Huelva and Granada.

Modernization and enlargement studies are underway at several Spanish paper companies. "La Papelera Espanola," the most important national company in the industry, is now studying a large modernization plan to cost $20 million in American dollars. Included in the proposal are set-ups for a soda-treated pulp, daily capacity, 80 tons; semi-chemical pulp, 35 tons capacity; level hard paper, press paper, kraft paper, and additions for undulated cardboard (corrugated), cardboard boxes and stucco paper.

The biggest pulp manufacturers are also the biggest paper producers. Among non-integrated companies, SNIACE obtains 40,000 metric tons of white chemical pulp yearly using eucalyptus wood, even though the biggest share goes for textiles.

During 1960, some 85,000 hectare have been reforested bringing the total since 1940 to 1,167,000. This should offset the current scarcity of wood in Spain and make it easier to install integrated factories with sawmills, pulp and paper, and paper products facilities. During 1961, 89,000 more hectares will be restored.

Belgium

1960 was all-time record year for paper

Population: 9,180,000. Per capita paper and paperboard consumption: 137 lbs.
Paper and paperboard mills: 25; woodpulp mills: 5; straw or other vegetable fiber mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	410,000	453,000
Chemical woodpulp	55,000	56,000
Mechanical or groundwood pulp (including wet lap) straw or other vegetable fiber pulp	89,000	104,000
Total Pulp Production	144,000	160,000

Principal paper grades manufactured: All kinds

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	256,700	307,800
Paper and paperboard exports	114,600	131,900
Pulp imports	203,000	215,000
Pulp exports	6,000	5,000

Principal paper and paperboard imports from: Netherlands, Finland, Sweden, U.S.A.
Principal paper and paperboard exports to: Netherlands, West Germany, France
Principal pulp imports from: Sweden, Finland, Norway, U.S.A.
Principal pulp exports to: France

By WILLIAM F. BOKS
Editor for Belgium

—Anvers

THE YEAR 1960 was a period of general prosperity and great activity for all Belgian industries, with brisk international trade, partly as a result of the startup of the Common Market, and with a noticeable increase in the general standard of living.

One of the results of this favorable trend was an all-time record in the consumption of paper, which jumped to 629,520 tons, viz. an increase of 14% over the consumption of 1959 and of well over 50% of the consumption only 10 years ago.

The considerable program of extensions and modernizations, started by the Belgian paper mills in the past years, began to bear fruit and the total national production of paper and cardboard in 1960 reached 453,000 tons, viz. an increase of 10½% over 1959. The production (in short tons) is split up as follows:

	1959	1960
Newsprint	90,000	104,000
Writing and printing papers	103,000	109,000
Kraft paper	35,000	36,500
Wrapping papers	88,000	95,500
Parchment and sulfurized paper	21,000	24,500
Other papers	28,000	31,500
Cardboard	45,000	52,000
	410,000	453,000

General Trade Rises

Imports of foreign papers showed an increase of 20%, reaching 307,800

BELGIUM—PULP
(in thousands of short tons)

	Production		Consumption	
	Chem.	Mech.	Chem.	Mech.
1939.....	28	36	155	65
1949.....	20	42	116	75
1952.....	34	55	100	68
1954.....	45	58	143	71
1955.....	45	62	202	75
1956.....	47	62	206	76
1957.....	48	86	238	101
1958.....	45	88	218	106
1959.....	55	89	242	99
1960.....	56	104	248	121

BELGIUM—PAPER CONSUMED
(short tons)

	Newsprint	Total Paper & Paperboard
1936.....	89,300	296,000
1949.....	77,100	346,800
1951.....	87,700	407,400
1953.....	90,820	405,994
1955.....	101,142	482,626
1956.....	101,522	483,592
1957.....	124,422	557,676
1958.....	116,297	515,152
1959.....	113,627	551,640
1960.....	131,240	629,520

BELGIUM—PAPER PRODUCTION
(in thousands of short tons)

	News	Book and Fine	Wrapping and Coarse	Total Paper	Paper Board	Total Paper and Paperboard
1939	52	85	85	235	26	261
1948	48	98	87	245	26	271
1950	68	105	113	304	23	327
1952	58	75	90	246	36	282
1953	61	79	117	270	37	308
1954	57	84	134	291	45	335
1955	62	88	193	306	46	352
1956	63	91	118	315	56	371
1957	94	99	121	365	57	422
1958	98	100	157	355	41	396
1959	90	103	172	365	45	410
1960	104	109	188	401	52	453

WILLIAM F. BOKS, who has served as editor in Belgium for a number of years, is administrator of Compagnie Commerciale Gross & Irgens, S.A., prominent in pulp and paper marketing.

tons. The total Belgian consumption was covered for about 26% by imports from Common Market countries and for about 29% by imports from outside the Common Market. Of these latter imports, a substantial proportion came from Eastern Europe at very low prices.

Also, paper exports are up with 15%, reaching 131,900 tons.

The entire Belgian paper industry without exception shows great vitality and practically all mills carry on, and even step up, their far-reaching programs for extensions and modernizations, so as to be ready for the increased competition which will undoubtedly follow as the customs barriers gradually disappear within the EEC.

Foreign Firms Active

Two new mills are being erected, mainly for the production of corrugated board boxes. One is located near Ghent and the other in the province of Hainaut, and both are created by Belgian paper companies in partnership with powerful American and British concerns. The number of supermarkets and self-service shops is rapidly increasing and this will strongly stimulate the packaging industries.

Prospects for 1961 remain encouraging and practically all of Belgium's 26 paper mills have a full orderbook for many months ahead. The average monthly production for the first four months of 1961 was around 36,500 tons.

Three Biggest Companies

The "Big Three" in the Belgian industry and their approximate percentage of total production:

Papeteries Belgique (over 30%)
Union Mills (about 20%)
Genval Mills (about 15%)
There are 31 mills in Belgium.

Denmark

Production records rise again; new tissue machine starts

By ERIK PERSSON
Editor for Denmark

Population: 4,600,000. Per capita paper and paperboard consumption: 198 lbs. (90 kg.)
Paper and paperboard mills: 12; woodpulp mills: 1; straw fiber mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	190,000	200,000
Chemical woodpu.p	5,000	6,000
Mechanical pulp	6,000	6,000
Straw fiber pulp	12,000	13,000
Total Pulp Production	23,000	25,000

Principal paper grades manufactured: Kraft and sulfite, book and writing, tissue, cigaret and fine, paperboard

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	240,000	273,000
Paper and paperboard exports	15,000	20,000
Pulp imports	110,000	124,000
Pulp exports	6,000	7,000

Principal paper and paperboard imports from: Sweden, Finland, Norway
Principal paper and paperboard exports to: West Germany, Sweden, Brazil
Principal pulp imports from: Sweden, Finland, Norway
Principal pulp exports to: England, West Germany

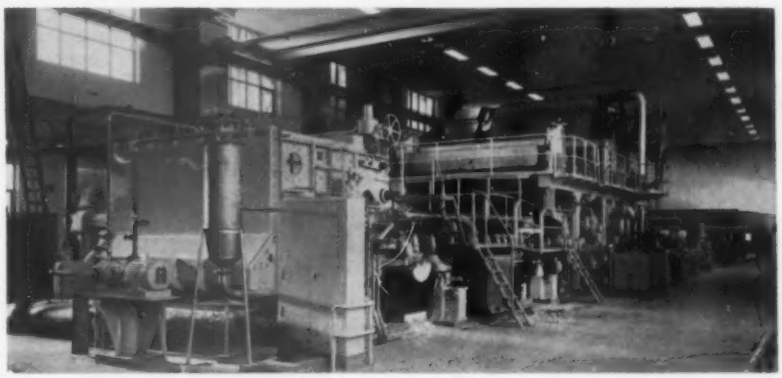
—Copenhagen

THE YEAR 1960 was yet another busy one in the paper industry in Denmark with all mills working at full capacity.

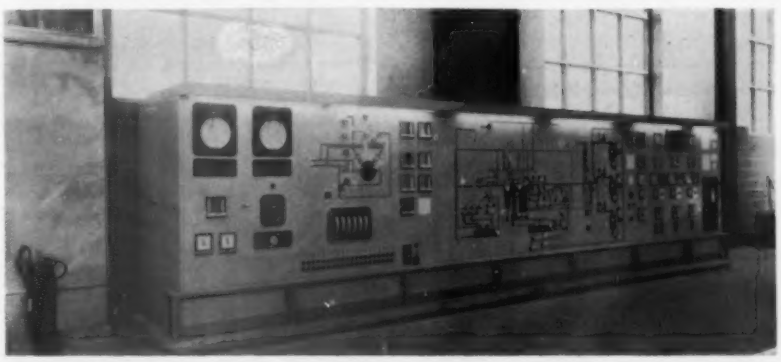
Production was increased again and went up by 10,000 tons to a new high record. Sales in this country were running at a very satisfactory level. Consumption of paper and paperboard has been growing at a remarkable speed during the last four years. Again imports were up by 13%, and total annual consumption is now about 460,000 short tons corresponding to 198 lbs. per head.

Paper prices were stable throughout the year, and as prices of most raw materials—the majority of which is imported—increased, and many other costs also went up, the profit margin has been narrowed for the paper industry.

The 5% import duty on paper and board remained unchanged in a new Customs Act of February 1960. The duty on converted products was raised slightly, compensating for the abolition of quantitative restrictions on these goods.



NEW BELOIT 135 INCH WIDE TISSUE paper machine is the latest and most modern addition at the United Paper Mills' major operation in Naestved, Denmark.



CONTROLS FOR NEW TISSUE MACHINE are concentrated on this modern graphic panel board at Naestved, Denmark.

EUROPE

In Ny Maglemolle Paper Mill, one of the United Paper Mills' six plants, a new tissue machine from Beloit Iron Works, U.S.A., was put into operation by the end of the year to meet the fast growing demand for soft tissue. The machine is 135 inches wide and operates up to 2,500 feet per minute. This mill is at Naestved.

A joint enterprise between the Danish Sugar Corp. Ltd. and United Paper Mills Ltd. was set up in Lolland under the name of Hojbygaard Fabrik. The new company, anticipated to go into operation by autumn 1961, will produce annually about 10,000 tons of semichemical straw paper from pulp made in a diffusion apparatus constructed by Danish Sugar.

Junckers Traekemi A.S. of Koge has started the erection of a plant for an annual production of 36,000 tons of semi-chemical pulp from hardwoods, mostly sawmill waste. Some small wood will be used. The mill is at Kalo, near Aabenraa, where the Jutland Ridge touches the east coast of Jutland at a protected harbor. Annual consumption of beechwood or other hardwoods will be about 100,000 cubic meters. The mill is to start up in late 1961. In a small experimental plant at Koge, this company has been making 6,000 tons of semichemical beech pulp, mostly imported to England.

Mr. Persson, author of the above report, is assistant to President Adam Bendix of the United Paper Mills Ltd. (de Forenede Papirfabrikker AB.) which he discusses very modestly in his article. The fact is that their company owns six mills in Denmark and produces about 90% of the nation's total paper and paperboard.

DENMARK—PRODUCTION
(in short tons)

	Pulp	Paper	Paperboard
1939	570	70,000	11,000
1947	120	78,000	19,000
1950	950	91,296	23,507
1951	908	98,933	15,235
1952	2,120	96,000	18,610
1953	3,850	97,023	25,358
1954	4,070	108,300	29,700
1955 ...	11,470	120,000	35,000
1956 ...	14,800	120,000	40,000
1957 ...	15,800	120,000	50,000
1958 ...	17,000	125,000	55,000
1959 ...	23,800	130,000	60,000
1960 ...	25,000	135,000	65,000

ERIK PERSSON, who again writes this special report on Danish pulp and paper industry. He is assistant to Adam Bendix, president and general manager of United Paper Mills of Denmark. This company, one of the most progressive in Europe, produces about 90% of Danish paper requirements. It also exports some paper to Latin America and other countries.

At Naestved, in the south, United Mills has a sprawling operation where grades are many and improvements are continually being made. In Fredericia, east of Copenhagen on Jutland, the United Mills has recently built one of the most modern continuous-operation straw pulp mills in Europe. Farmers are partial owners of this plant with United.

Portugal

Two new pulp mills are important additions here

Population: 9,280,000. Per capita paper and paperboard consumption: 23 lbs.
Paper and board mills: 16; pulp mills: 3

PRODUCTION (short tons)	1959	1960
Paper and paperboard	95,590	120,000
Pulp production	76,560	95,000
IMPORTS-EXPORTS (short tons)	**1959**	**1960**
Paper and board imports	15,290	17,400
Paper and board exports	9,570	10,000
Woodpulp imports	31,130	25,420
Woodpulp exports	39,490	40,000

Principal paper grades made: Kraft paper, bag paper, newsprint
Principal paper imports from: Sweden, U.K., France
Principal paper exports to: France, U.K.
Principal pulp imports from: Sweden, Finland
Principal pulp exports to: U.K., France, Belgium

—Lisbon

Two MORE well equipped and engineered woodpulp mills—one sulfate and one sulfite—combined with the quality of plants already in existence in this country, places Portugal among the more important Continental European producers of pulp and paper.

For many years this country has exported substantial amounts of high quality eucalyptus sulfite pulp. Prehydrolized pine pulp is planned as a new pulp product in Portugal. When Shr. Carvallo, president of SOCEL and also president of Portugesa Celulosa, called for bids on the new SOCEL enterprise, nearly every important machinery producer in Europe journeyed to Lisbon. In Lisbon, also, pulp and paper industry leaders from most Western European nations met recently to discuss effects of the market blocs on their industry.

Sociedade Industrial de Celulose (SOCEL) is building Portugal's fourth pulp mill, this one of 220 short tons (200 metric) kraft pulp capacity, one half bleached. The site is near Setubal, 30 miles south of Lisbon with an ocean port nearby.

Both eucalyptus and pine will be cooked in stainless steel clad digesters from Scholz & Co., Coesfeld, Germany.

"No. 1 production line will produce bleached eucalyptus pulp," President Carvallo told this magazine. "No. 2 line will produce unbleached eucalyptus half the time and unbleached pine half the time. Transportation will be by ships and a harbor is being prepared."

Sunds Verkstäder of Sweden is delivering a complete 150 ton/day bleach plant and two 120 ton/day filter washers. Svenska Flaktfabriken is building a modern air cushion type pulp enclosed dryer and electro filters. The wet end is by Myren A.S. of Oslo, Norway. Rosenblads of Sweden is providing evaporation plant and heat recovery. Svenska Maskinverken is building both the power steam boiler and the heat recovery boiler. Later this mill also will make paper.

Another important project in Portugal is the second eucalyptus sulfite pulp mill for Caima Pulp Co. Ltd. of Oporto. It is located at Constancia, on the River Tagus, 72 miles upstream from Lisbon. It was being completed in the middle of 1961. Initial production was 20,000 tons of easy bleaching sulfite annually, later to be 40,000 tons. Markets will be in Britain, France, Belgium and Portugal.

For years Caima has been producing 20,000 tons annually of bleached and easy bleaching sulfite eucalyptus pulp at its mill 36 miles south of Oporto. A major portion has been shipped abroad.

Boving & Co. Ltd., London, planned and coordinated engineering of the new Constancia mill. The pulp dryer is from Svenska Flakt of Sweden and waste liquor concentration plant

by AB Ramens. A Babcock & Wilcox boiler and A.E.I. generating plant came from England. Two stainless steel clad digesters have 175 cubic meters capacity each and the mill is equipped with British Marco conveyors for log and chip handling, with chippers by Karlstads Mekaniska Werkstad of Karlstad, Sweden. Ahlfors screens from Sweden and diffuser bins for washing are used.

North of Lisbon, Portugesa Celulosa, also headed by Shr. Carvallo, added groundwood to its pulp grades recently and it is making kraft paper, bags and newsprint as well as kraft pulp.

PUSH-BUTTON CONTROLLED stock preparation system with a graphic panel is a feature of the new Csepel Paper Mill. Three kinds of pulp are used. This is one of the most modern units in eastern Europe. It prepares stock for this Hungarian mill's new J. M. Voith kraft paper machine.

Hungary

Paper, board production at new high, demand increases

Population: 10,021,000. Per capita paper and paperboard consumption: 40 lbs. (18 kg.) Paper and paperboard mills: 9; woodpulp mills: 4; straw fiber mills: 2

PRODUCTION (short tons)	1959	1960
Paper and paperboard	136,298	153,136
Chemical woodpulp	22,216	21,017
Mechanical pulp	20,967	22,453
Straw fiber pulp	4,803	5,274
Total Pulp Production	47,986	48,744

Principal paper grades manufactured: Kraft, sulfite, book and writing, tissue, cigaret and fine, and paperboard

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	50,668	50,000
Pulp imports	31,509	45,000

Principal paper and paperboard imports from: U.S.S.R., Czechoslovakia, Scandinavia, Austria

Principal pulp imports from: U.S.S.R., Czechoslovakia, Scandinavia, Austria

By DR. GEORGE VAMOS
Editor for Hungary

—Budapest

DEMAND FOR PAPER and paperboard continues to increase in Hungary, and the building of mills and extension of pulping raw materials must be carried forward to meet these needs.

The use of rice and wheat straw and of poplar, willow, beech and other hardwoods is projected along with increases in sulfate and sulfite pulp capacities.

The production of paper and board by Hungarian mills reached a new high record of 153,136 short tons in 1960, more than a 50% increase over the production level of 1957. It is expected to reach 230,000 tons by 1965.

Major expansion has been at Csepel Paper Mills, which launched a $16,000,000 (US) program about three years ago, calling for new power plant, modern papermaking equipment and a new corrugating operation. It came recently at the end of the reconstruction of the sulfite mill where enlargement was made possible by addition of Boiler No. 4 of 240 m^3 with bimetal construction.

DR. GEORGE VAMOS, editor in Hungary, is director of the Hungarian Paper Industry Research Institute in Budapest.

The mill is going to begin this year the production of a high yield poplar pulp, with a process worked out by a collective team of the mill and the Hungarian Research Institute of the Paper Industry. This would offset the shortage of softwood for papermaking in Hungary. Major unit at Csepel was the kraft paper machine built by J. M. Voith GmbH, operating at 1,150 feet per minute and producing 100 tons per day. It has 36 paper dryers and 14 felt dryers. Fibrella pulpers, Trimbey screens and Vortraps cleaners were installed.

Construction of a new straw pulp mill in Sztálinváros is continuing and will begin production in early 1963. Komplex is investing £1,000,000 ($2,804,000) in this mill. Equipment is being supplied by Lyddon & Co. Ltd., largely manufactured by Black-Clawson International in England. It will make 25,000 tons annually of bleached straw cellulose for paper from 74,000 short tons of baled straw. Equipment includes a Pandia conuous digester. Later paper machines would be added.

Another semi-chemical straw mill south of Budapest is utilizing straw also. Equipment here includes Sprout-Waldron equipment. Other expansion projects were a Szolnok bag factory and Buda box plant.

In November 1960, Budapest was the scene of an International Conference on Paper Drying. It drew delegates from many countries who are experts in drying techniques. In the fall of 1959, Budapest was host to an International Conference on Pulp and Paper Manufacturing and Graphic Arts. Straw pulping possibilities in Europe were discussed by a number of the speakers at this meeting which drew experts from 14 East and West nations.

HUNGARY—PULP AND PAPER PRODUCTION
(in short tons)

	Paper and paperboard	*Chemical woodpulp*	*Mechanical woodpulp*	*Straw pulp*	*Total pulp*
1957	103,000	18,500	17,400	3,000	38,550
1958	121,300	19,800	19,600	3,000	42,400
1959	136,298	22,216	20,967	4,803	47,986
1960	153,136	21,017	22,453	5,274	48,744

Rumania

Use of delta reeds may greatly increase production

Population: 20,100,000. Per capita paper consumption: 42 lbs.
Number of paper and paperboard mills: 7; woodpulp mills: 7

PRODUCTION (short tons)	1959	1960
Paper and paperboard	139,700	154,000
Woodpulp	120,000	130,000

By O. RUSSO
Editor for Rumania

—Bucharest

A RAPID DEVELOPMENT of the pulp and paper industry of the Rumanian People's Republic is under way. Whereas only 139,700 short tons of paper were made on 20 machines in 1959 (last year, 154,000 short tons), the nation's output will be increased by 330,000 short tons in 1965 with the addition of only 10 machines in six more mills.

Half as many modern paper machines as now exist in Rumania will triple the production. Or to put it another way, the average output of each of the new machines we will introduce will be four times as great as the average of the small machines now in use.

Plans for major growth of the Rumanian industry are based on use of the fast-growing reeds of the Danube Delta, a material historically in very low harvest (The *phragmites communis* type reed. Only about 1% has been harvested. Dikes will regulate water flow. An amphibious harvester is being developed).

In 1960 only, the production of paper increased by 2 kg per capita over the preceding year.

Starting with the year 1938, paper production in Rumania shows the following evolution (in thousands of metric tons):

1938	1950	1955	1958	1959	1960
61	86	109	118	127	140

In the past, the raw material basis for the pulp and paper industry was exclusively made up of coniferous woods. In order to satisfy ever-increasing needs, from 1948 the attention of the industry of Rumania was directed towards the finding of new raw material sources.

The utilization of the reeds from the Delta of the Danube has created conditions to ensure the supply of a pulp-plant for the manufacture of rayon, which went on stream in 1960 in Braila and of the plants in Braila which produce hemicellulose and cardboard from reed, of the hardboard plant of Tulcea, of the plant of plates of building material made of reed ("stufit"), etc.

O. RUSSO, who wrote the accompanying article on Rumania, has taken over duties as the editor for the Rumanian People's Republic for this publication. He is secretary-general of the Rumanian Scientific Association of Engineers and Technicians. He was proposed for the editorship by Mme. Elena Calistru, who found that her work as a paper industry technician at the Institutul Politehnic, in Iasi, Rumania, where her husband is a professor, was too remote from the center of paper industry activities for her to carry on. She was previously the editor for Rumania.

The aggregate works of Braila have the object of processing yearly 700,000 tons of reed in the form of pulp, paper, cardboard and man-made fibers.

In the course of 1960, there were commissioned the first industrial units producing cellulose and hemicellulose from reed and straw.

As to the deciduous woods, about 300,000 cubic meters of beech wood will be processed in the new paper plants and works by 1965.

Future Pulp Resources

Owing to the increased variety of the raw material, the structural evolution of the paper production will be as follows:

Raw Material for Paper

	1960	1965
Coniferous pulp	87%	47%
Pulp and hemicellulose from reed	7.5%	26%
Pulp and hemicellulose from straw	5.5%	15%
Deciduous pulp	—	12%

Due to a 2.9 times increase projected for paper production by 1965, the increase in pulp production will exceed 4.5 times present output during the same interval of time.

Several new paper pulp mills of more than 360,000 metric tons annual capacity, as well as paper mills of about the same capacity, will help in achieving growth projected for the paper industry during the Six Year Plan. The development and expansion of the existing factories and works, as well as the replacement of the equipment because of a high rate of physical depreciation in the pulp and paper industry, will also contribute to obtain the expected results. Innovations brought into newsprint manufacture will increase production by 35% as compared to 1959.

In 1959, 127,000 metric tons (139,700 short tons) of paper have been obtained in seven plants with 20 paper machines. By 1965, six plants with only 10 paper machines (of which only seven will work at their full capacity) will achieve a 300,000 tons paper increase as compared to the 1959 production.

During the same period, the number of workers employed in the pulp and paper industry will increase by 32% as compared to the present.

All these figures obviously demonstrate the new development opportunities offered to the Rumanian paper industry.

Parsons & Whittemore is engineering and assisting in construction of what is to be one of the largest and probably most modern mill in Rumania, designed to produce 200 tons daily of bleached kraft board and paper with conversion units including bag plant. The machine is under construction at Black-Clawson International, in England. The project engineer is Lovell M. Cushing, formerly of Brown Co. and other U.S.A. companies. He was builder and former manager of the pre-hydrolized bleached kraft pulp mill of Cellulose d'Aquitane S.A., at St. Gaudens, in the French Pyrenees, completed in 1959. The mill will be near Suceava.

Yugoslavia

Extensive expansions in both pulp and paper

Population: 18,500,000. Per capita paper and paperboard consumption, 19.8 lbs.
Paper and paperboard mills: 12; woodpulp mills, 6; straw or other vegetable fiber mills, 2

PRODUCTION (short tons)	1959	1960
Paper and paperboard	172,700	192,500
Chemical Woodpulp	120,000	127,600
Mechanical woodpulp	57,200	64,900
Total pulp production	177,200	192,500

Principal grades manufactured: Newsprint, kraft and sulfite papers, writing and book, paperboard, tissue, cigaret, fine papers

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	28,500	30,000
Paper and paperboard exports	8,250	14,000
Chemical woodpulp imports	20,800	29,000
Chemical woodpulp exports	34,200	43,000

Principal paper and paperboard imports from: U.S.S.R., Finland, France
Principal paper and paperboard exports to: U.S.S.R., United Arab Republic
Principal woodpulp imports from: Austria, West Germany
Principal woodpulp exports to: Poland, Uruguay, Italy

By BODIZAR STRASEK
Editor for Yugoslavia

Statistics supplied by Ing. Benko Stane of the Rijeka mill

—Zagreb

FOR A LONG TERM expansion program in this country, it is anticipated no fewer than 20 paper machines will be needed. At least the earlier part of this expansion is being pushed very rapidly.

As for the more immediate 1961-62 program, it is anticipated that paper and paperboard production will be increased from last year's record of 192,500 short tons. Capacity of 550,000 short tons is projected in some years according to an OWIKO report.

By this year, export trade in Yugoslavian paper should reach about 20,000 tons, an increase of 6,000 over last year. Yugoslavia is known in many parts of the world for its sulfite pulp, which it has exported for a long time. Cellulose exports reached 43,000 tons in 1960.

During 1960 a major expansion was being completed at the Celluloze Prijedor mill in Bosnia, heretofore an important sulfite exporter of many years. But the additions are for paper with two Voith Austrian-built machines of annual capacity of 14,100 metric tons.

More New Mills

A contract worth more than 3,000,000 pounds (British) for a complete paper mill at Plaski in Croatia was awarded by Yugotehna of Belgrade to the British paper machinery manufacturing firm of Millspaugh-Wimpey. Technical assistance also will be provided for a 120 tons a day of kraft pulp. The Plaski mill, about 60 miles southeast of Rijeka, was damaged during the partisan warfare. Much of the equipment will be constructed at the Sheffield, England, works of Millspaugh Ltd. The Yugoslav organization which operates this mill will be

BOZIDAR STRASEK, in charge of construction and imports of equipment for the Zagreb Paper Mills, one of the biggest in his country. He is editor for Yugoslavia.

Tvornica Sulfatne Celuloze y Papira.

A new mill in Montenegro near Ivangrad is scheduled to be started up in 1962. All equipment, at a value of 35 million German marks, has been placed in Belgrade with the German-Finnish cooperative association, HABAG Import and Import GmbH, of Düsseldorf, a subsidiary of Rheinische Stahlwerke. Er-We-Pa of Germany is building a 100 tons per day writing and printing paper machine. From Finland will come a continuous kraft cooking system. Babcock & Wilcox is supplying recovery and power plants. Cost of the mill, about $9,000,000.

A new mill to make 24,000 tons a year of cellulose and paper at Dvar, in Bosnia, is being equipped by Japan primarily. Kanematchu of Tokyo granted a $10,000,000 cred.t. Fabrika Celluloza Dvar AD was completely destroyed by bombing in World War II. The new mill will make high grade writing, printing and packaging papers.

In Zagreb Paper Mill Ltd., 66 years old, considerable expansion already has been completed. The chemical pulp area was expanded and a new paper machine (11,000 tons annual capacity) installed from Finland.

There is a great deal of interest among Yugoslavia papermakers in straw pulping and there are plans to utilize the straw fibers available. In Loznica, Serbia, a mill is planned for 33,000 tons annually, to use beech wood. A semi-chemical pulp and board mill is planned in Donji Vakuf, Bosnia.

Papirnica Vevce has ordered papermaking machinery from Bell Engineering Works in Switzerland. Fine and woodfree paper machines for Cacak Papierfabrik AG and Beograd, and paperboard and container plant additions at the Belisce and Kolicevo plants were scheduled for production.

YUGOSLAVIA—CELLULOSE IMPORTS-EXPORTS
(in short tons)

	Chemical Pulp	
	Imports	*Exports*
1957	150	20,000
1958	13,202	28,975
1959	20,800	34,200
1960	29,000	43,000

YUGOSLAVIA—PULP-PAPER PRODUCTION
(in short tons)

	Paper	*Board*	*Total Paper*	*Chemical Woodpulp*	*Mech. Woodpulp*	*Total Pulp*
1957	85,705	62,450	148,155	103,750	49,206	152,956
1958	98,170	71,009	169,179	108,764	54,316	163,080
1959	92,300	80,400	172,700	121,700	56,200	177,900
1960	105,270	87,230	192,500	170,000	60,000	230,000

Ireland

Consumption up to 90 lbs. as paper industry grows

Population: 2,839,000. Per capita paper and paperboard consumption: 90 lbs. (40 kg)
Paper and paperboard mills: 5; woodpulp mills: 1; straw or other vegetable fiber mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	89,600	92,064
Mechanical pulp	6,160	6,160
Straw or other vegetable fiber pulp	4,480	4,480
Total Pulp Production	10,640	10,640

Principal paper grades manufactured: Newsprint; kraft; sulfite; book and writing; paperboard

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	60,480	70,296
Paper and paperboard exports	25,760	33,995
Pulp imports	33,600	44,012

Principal paper and paperboard imports from: Sweden, Canada, Great Britain
Principal paper and paperboard exports to: Great Britain
Principal pulp imports from: Scandinavia
***Population for Republic only—Northern Ireland excluded**

By P. G. SHERRY
Editor for Ireland

—Dublin

FOR THE IRISH paper industry, 1960 was a year of steady progress and of preparation for expansion and installation of new equipment during 1961.

Of the country's five paper and paperboard mills, one is in a suburb of Dublin, three are within a 10 miles radius of the city center, and the fifth, National Board and Paper Mills, is in Waterford, on Ireland's east coast.

Killeen Paper Mills, Ltd. Inchicore, Co. Dublin, manufactures paper and paperboard and conducts large conversion operations in a paper bag factory, a corrugating plant and a plant manufacturing all types of boxes. A new machine for the manufacture of single-faced and double-faced corrugated paper from glassines and greaseproofs is projected for 1961.

Modifications to existing stock preparatory plant and paper machines are being carried out to increase the paper mill capacity by 25%.

Killeen controls three subsidiary

EUROPE

companies: Killeen Paper Mills (Great Britain, Ltd.) at Slough, England, supplies converted material to Killeen's English customers; M. Duan & Co. Ltd. are concerned with the collection of waste paper, the prime raw material for Killeen's board manufacture; and P. O. O'Reilly, Ltd. boxmakers and printers. At the parent company, a straw-pulp plant is in production.

Clondalkin Paper Mills, Ltd , Clondalkin, Co. Dublin, during the past year replaced the entire wet end on No. 1 Yankee paper machine. The wet end and headbox were supplied by Beloit Italia. A new sectional electric drive, suitable for 1300 feet per minute, was engineered by Harland Drives of Alloa, Scotland. To give an immediate increase in drying capacity, an experimental high velocity air cap made by Thomas McDowell's of London was fitted to one of the pre-drying cylinders.

During 1961, the entire press and pre-dryer sections will be rebuilt, and the winder will be replaced. A heavy duty high speed Beloit slitter will take care of extra output as the machine moves up from its existing top speed of 850 feet per minute.

In the groundwood mill, a new debarking drum (Waplan), four pocket grinder (Miag) and a primary screen (Miag) have been installed as the first step towards tripling existing capacity. Still to be delivered are a concentrator (Kvarnsveden), and a Kamyr mould complete with presses and baling equipment.

Clondalkin controls a wholly owned subsidiary company, the former Drimnagh Paper Mills, which has warehousing facilities and is a sales outlet for certain grades. There is also an associate company, C. B. Paper Sacks, Ltd., manufacturing all types of multiwall paper sacks and baler bags.

Swiftbrook Paper Mills, Ltd., at Saggart, Co. Dublin continued a long tradition of paper-making, supplying printings and writings to the Irish market.

Jefferson, Smurfit, Ltd., Clonskeagh, Dublin, producing corrugated medium for use in their own conversion plant, plan a replacement of their existing refining equipment, with Scots-Reitz refiners.

National Board and Paper Co., Ltd., of Waterford, under a management contract to the St. Joe Paper Co. of Florida, U.S.A., continued uninterrupted production of paperboard and paperboard products. The general manager is Ed. Downey, veteran of U.S. papermaking.

DR. PETER G. SHERRY, editor for Ireland, is assistant general manager and general manager of the manufacturing division of Clondalkin Paper Mills, Ltd., Dublin. He holds a doctorate in organic chemistry from the National University of Ireland.

Iceland

Imports show 19% drop

Population: 177,100. Per capita paper and paperboard consumption: 92 lbs. (41.7 kg)

IMPORTS-EXPORTS

(short tons)	1959	1960
Paper and paperboard imports	10,031	8,112
Pulp imports	—	0.1

Principal paper and paperboard imports from: Finland, U.S.A., Eastern Germany

By HALLDÓR JÓNATANSSON

—Reykjavik

THIS ISLAND REPUBLIC in the North Atlantic produces no paper products. It depends upon imports, mainly from Finland, Eastern Germany and the U.S.A.

During 1960, paper imports showed a drop of 19% from 1959 (which was a banner year in this commodity and 38% over 1958), according to the Ministry of Commerce.

The International Cooperation Administration, U.S.A., announced a procurement authorization of $300,000 for delivery of paper products to Iceland during the period April 10, 1961, to April 30, 1962.

Bulgaria

Plan straw pulp developments and more paper production

Population: 8,124,000. Per capita paper consumption: 18 lbs.
Paper and paperboard mills: 7; pulp mills: 4

PRODUCTION (short tons)	1959	1960
Paper and paperboard	62,370	59,400
Chemical woodpulp	22,700	21,450
Mechanical woodpulp	13,650	12,800

IMPORTS-EXPORTS

(short tons)	1959	1960
Paper and paperboard imports	23,800	25,000
Woodpulp imports	24,000	18,000

Principal paper grades made: Newsprint, book, writing, cigaret and fine papers
Principal paper and paperboard imports from: U.S.S.R., Czechoslovakia
Principal woodpulp imports from: U.S.S.R., Finland

—Sofia

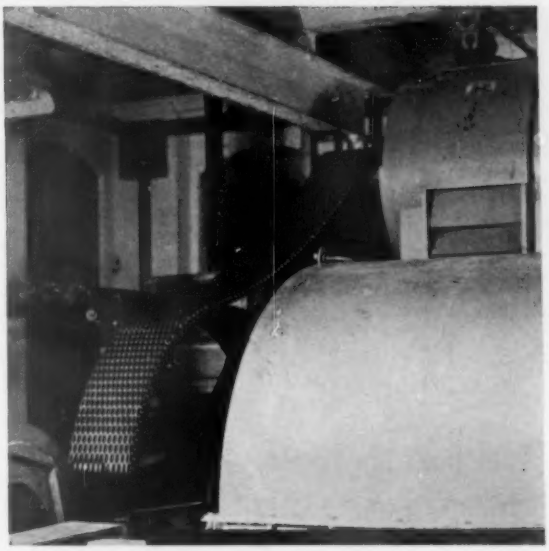
A GOAL of more than 200,000 tons of paper production and quadrupling of chemical pulp production to nearly 100,000 tons is the 1962 target of the Tito government. Plans call for two straw pulp mills, using semi-chemical processes, and for kraft mill expansion and paper increases, including packaging paper and board especially.

Meanwhile, however, there was a slight decline of 5% in actual paper production in 1960 to 54,000 metric tons (59,400 short tons) but imports were stepped up. Technological improvements are reported under way in several mills.

The accompanying table shows a steady, though not spectacular, growth in the pulp and paper production of Bulgaria since 1954, despite the slight decline last year.

BULGARIA—PULP AND PAPER
(in short tons)

	Production			Imports		Exports
	Paper	Chem. pulp	Mech. pulp	Paper	Pulp	Paper
1954	38,169	14,616	—	21,705	12,701	—
1955	47,559	16,110	—	16,652	18,995	600
1956	48,985	16,328	11,440	21,973	22,781	730
1957	50,271	17,543	10,894	25,631	29,117	922
1958	51,850	19,257	11,241	23,255	18,937	—
1959	62,370	22,700	13,650	23,800	24,000	—
1960	59,400	21,450	12,800	25,000	18,000	—



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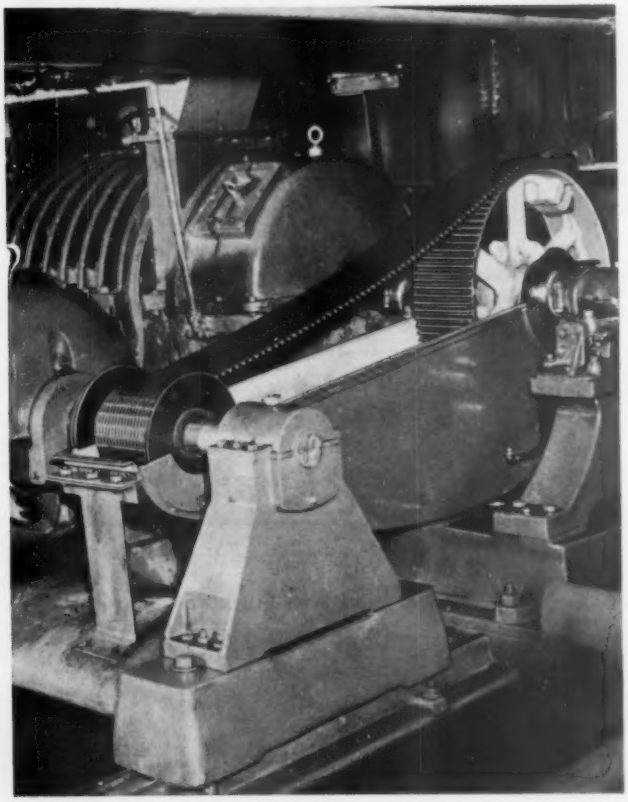

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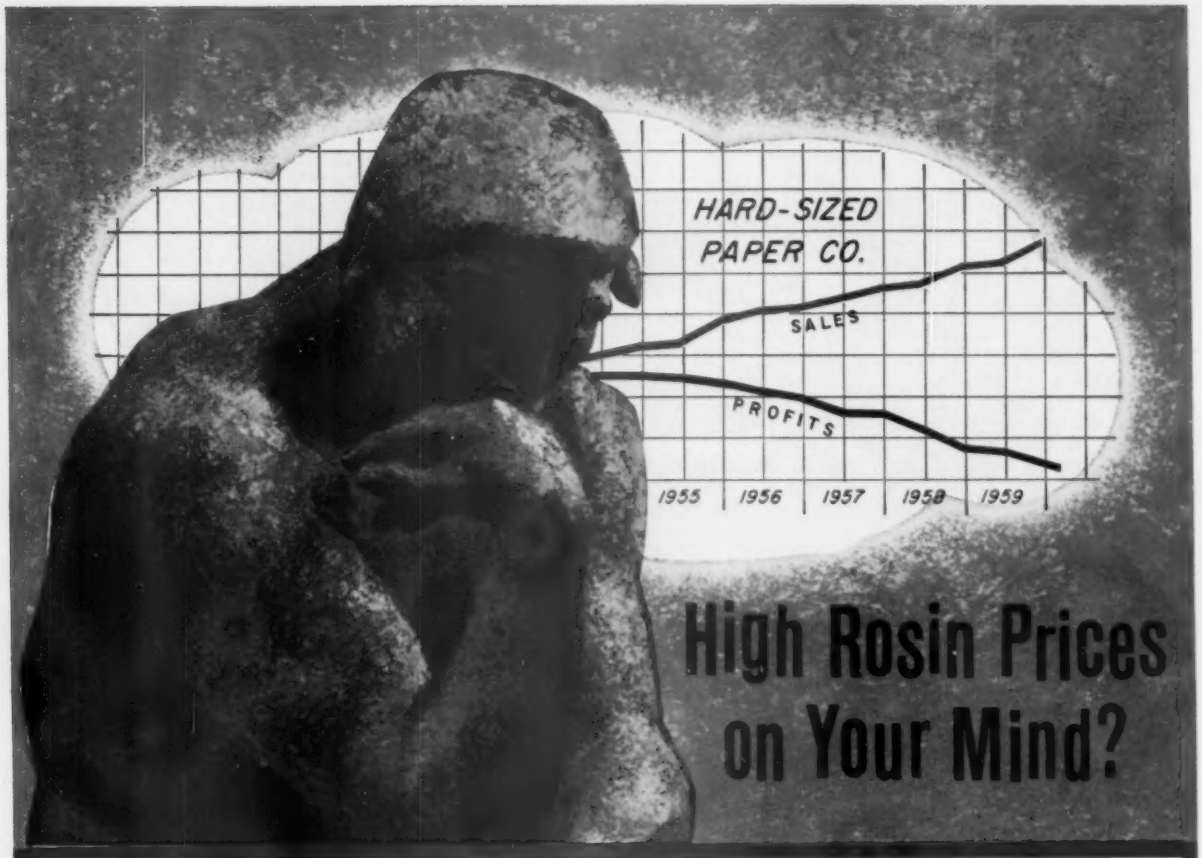

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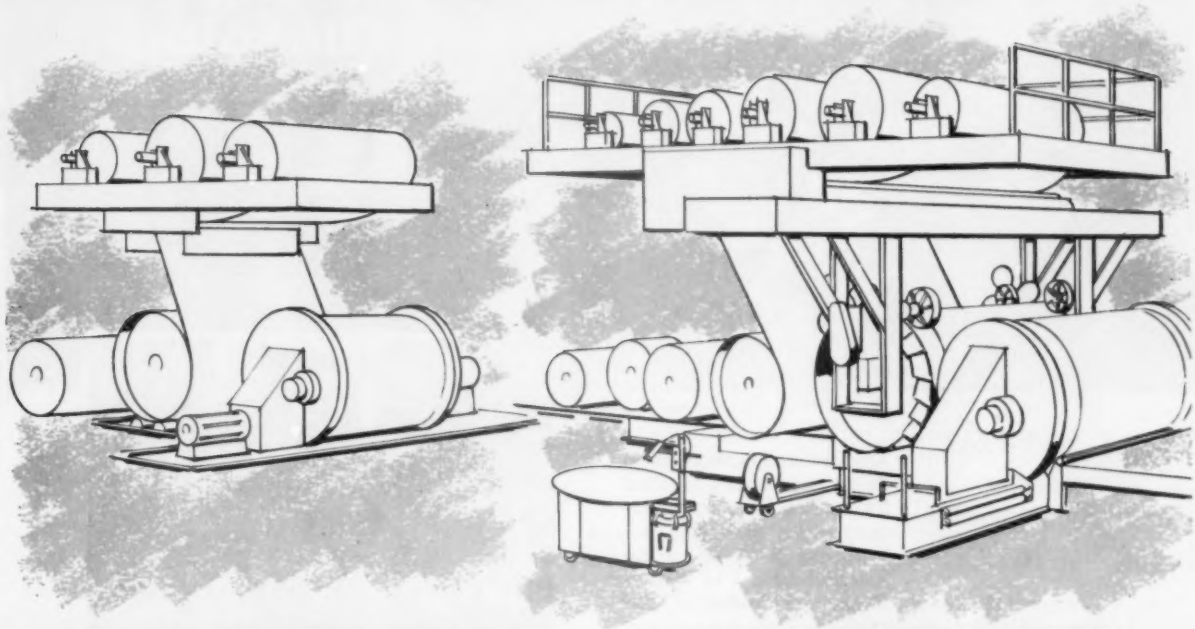

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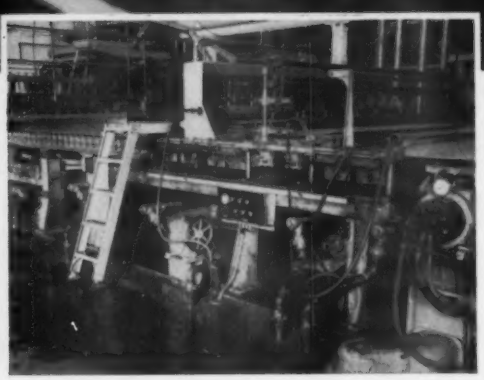

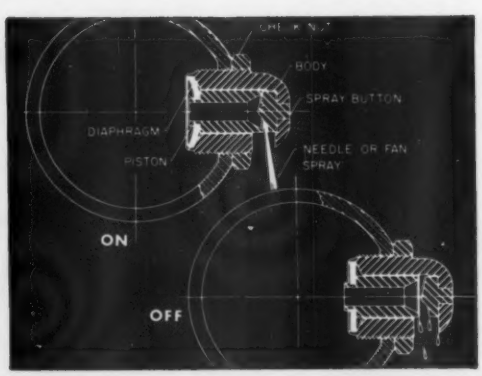

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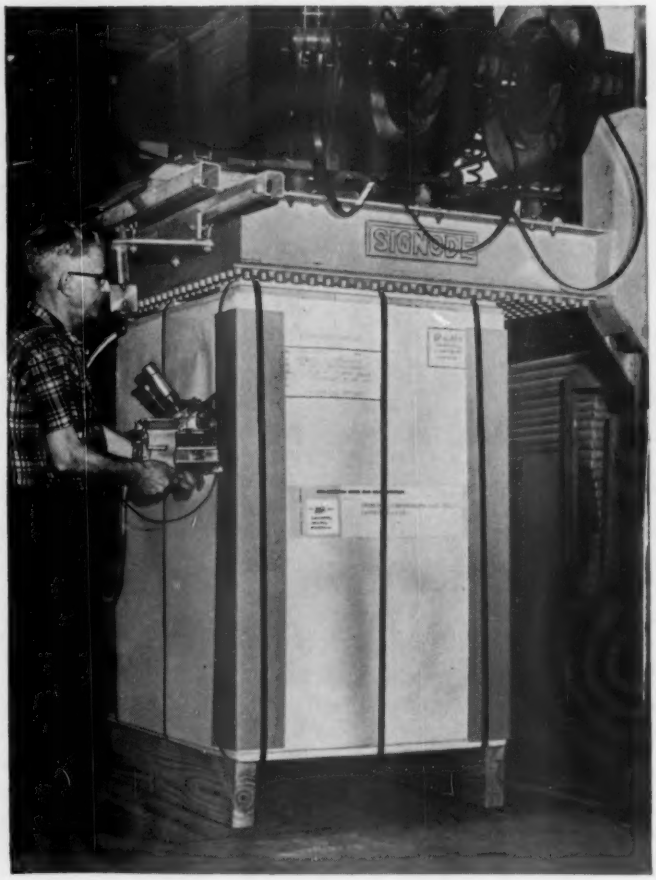

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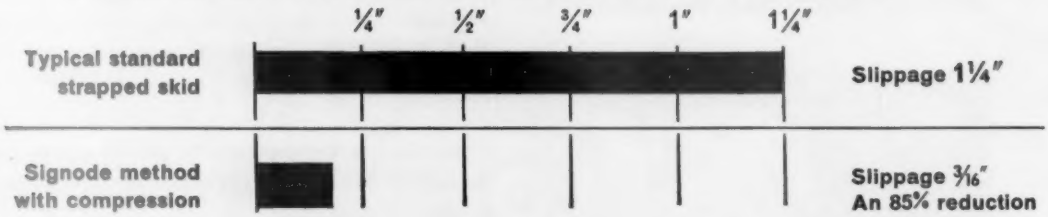

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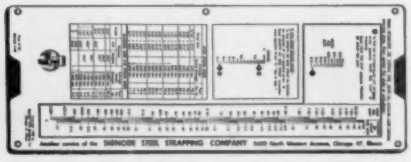

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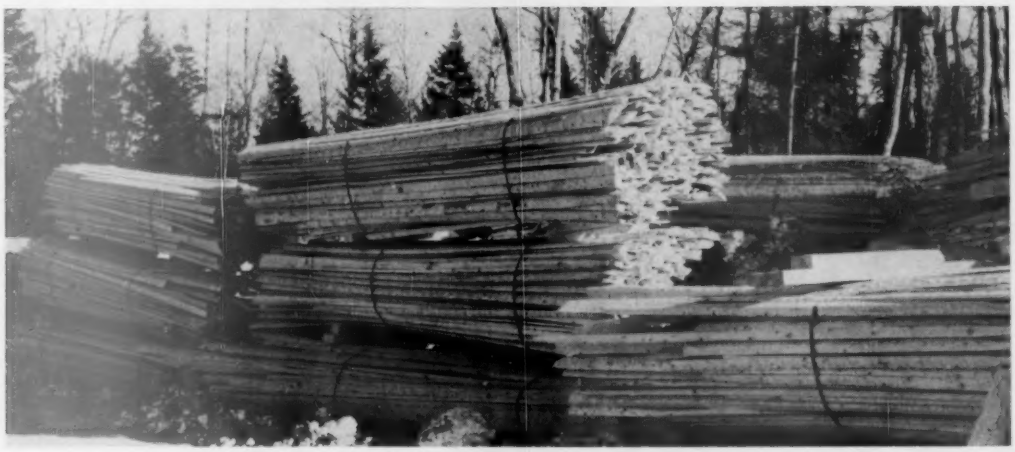

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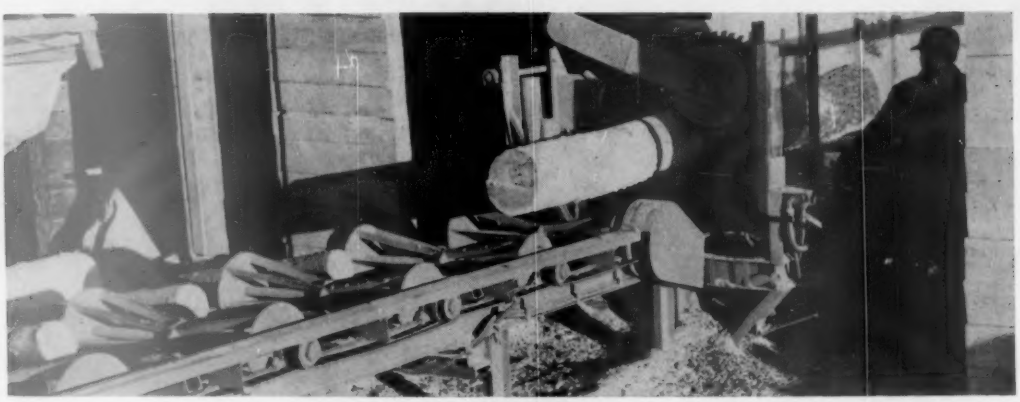

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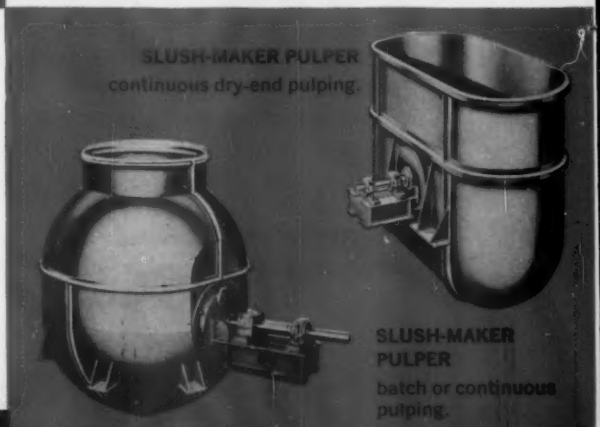

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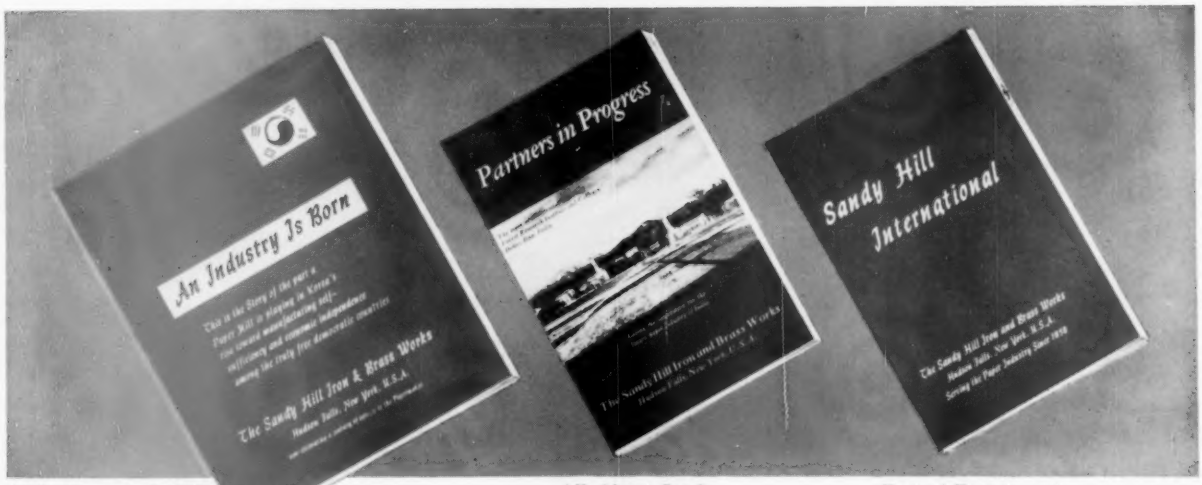
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ASIA

Strides in production and technology are reported. Japan increased paper output 764,000 tons last year, greatest increase in the world.

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PRINTING PAPERS are sold in Korea from this typical retail paper store.

ASIA

Japan

Sets sights on growing markets in Asia

Population: 93,406,830. Per capita paper and paperboard consumption: 102.5 lbs. (46.52 kg)
Paper and paperboard mills: 635; woodpulp mills: 188; straw or other vegetable fiber mills: 3

PRODUCTION (short tons)	1959	1960
Paper and paperboard	4,219,000	4,974,000
Chemical woodpulp	2,300,711	2,778,310
Mechanical pulp	1,005,314	1,105,600
Straw or other vegetable fiber pulp	8,910	9,190
Total Pulp Production	3,315,000	3,893,100

Principal paper grades manufactured: All kinds

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	8,380	1,172
Paper and paperboard exports	120,845	186,344
Pulp imports	109,188	152,762
Pulp exports	5,721	23,025

Principal paper and paperboard imports from: U.S.A., Canada, Sweden
Principal paper and paperboard exports to: Indonesia, Hong Kong, Thailand
Principal pulp imports from: U.S.A., Canada, Finland, Sweden
Principal pulp exports to: U.S.S.R., Australia, Korea, Philippines

By MOTOKI MATSUNAGA
Editor for Japan
—Tokyo

SIGNIFICANT AND SUBSTANTIAL strides have been made by the pulp and paper industry of Japan in the past 10 years. All indications are that these strides will continue at the same pace for the next 10 years, not only in growth of production and consumption of paper products but also in technical progress.

Since 1950 Japan's appetite for paper has jumped from 22 lbs. per person to the present 102.5 lbs. Its pulp production has risen from 810,000 short tons to more than 3,893,100 tons, while paper production has climbed from 950,000 tons to 2,778,310 tons.

Technically, Japan has advanced significantly, too. Pulp technology has recently made outstanding progress and the production of pulps using hardwoods for dissolving and paper grade kraft pulps, semichemical and mechano-chemical pulps has greatly increased. This is a reassuring trend because Japan is rich in hardwoods.

Temperature, climate, and abundant rainfall combine for favorable conditions for the generation and growth of trees. The volume of forest resources is estimated at more than 1,830,000 cubic meters. The Japan Paper & Pulp Assn. estimates Japan is the second largest in the world after Finland in terms of proportion of forest resources against land area. About 45% are coniferous trees, the rest hardwoods. Pulp production is predominantly dependent upon wood; pulps from straw, manila and used fibers comprise only 1.6% of the total.

Will Grow with Asia

Japan is keenly aware of its position on the edge of a dynamic and growing market for paper in Afro-Asian countries. It realizes that advances in education, industrial developments and elevation of cultural standards will cause a sharp upswing in the consumption of paper—and the pulp and paper industry of Japan stands ready to serve this market. The pulp and paper industry in Japan is expected to grow side by side with the elevation

JAPAN—PAPER PRODUCTION BY GRADES
(in thousands of short tons)

	Newsprint	Printing Paper	Wrap' Paper	Writing Paper	Other Paper	Liner Board	Other Board	Total
1955	507	578	63	270	360	199	452	2,429
1956	272	615	78	309	435	286	536	2,831
1957	613	700	71	372	493	379	636	3,264
1958	629	701	76	365	489	409	627	3,296
1959	762	865	89	467	594	676	766	4,219
1960	807	975	94	567	719	819	994	4,974

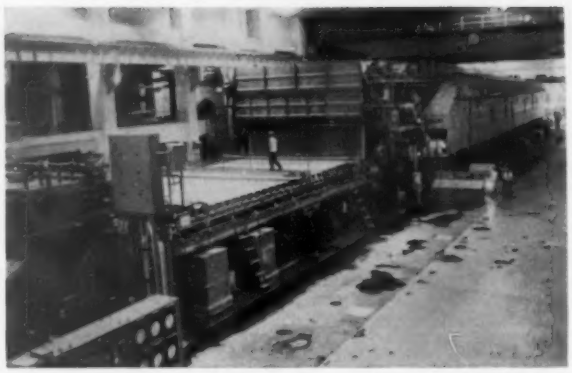
JAPAN—PULP PRODUCTION
(in thousands of short tons)

	Sulfite (Rayon)	Sulfite (Paper)	Sulfate	Soda Other Chem	Wood Ground	Semi-Chem.	Total
1955	306	548	415	56	726	53	2,104
1956	408	550	538	62	788	82	2,428
1957	444	553	689	77	850	110	2,723
1958	317	474	811	85	797	131	2,615
1959	376	565	1,098	133	946	197	3,315
1960	417	564	1,511	171	993	237	3,893

JAPAN—PAPER PRODUCTION, IMPORTS, EXPORTS, CONSUMPTION
(in thousands of short tons)

	Production	Imports	Exports	Consumption Total	Consumption per Capita (in lbs.)
1955	2,429	1	87	2,423	52.5
1956	2,831	1	117	2,715	60.1
1957	3,264	4	116	3,152	69.2
1958	3,296	6	113	3,189	69.3
1959	4,219	8	121	4,106	87.7
1960	4,974	1	186	4,789	102.5

KRAFT PULP MILL is under construction at Ishinomaki mill of Tohoku Pulp Co. Ltd. This mill also produces bleached sulfite and dissolving pulps, newsprint and other papers.



NEW NEWSPRINT MACHINE at Kushiro mill of Jujo Paper Mfg. Co. now in full operation producing 209 metric tons/day. Machine is 274 in. wide.

of cultural and living standards in the countries of Southeast Asia.

Along with the upward activity in the world economy, Japan made a remarkable expansion in her general economy in 1960. Her gross national product increased 13% with 22% of industrial production. Favored with these circumstances, the pulp and paper industry gained 19%, (5,003,340 short tons) and 58% (184,080 short tons) in paper production and export.

The Japanese paper mills, mostly newsprint, have increased their capacity considerably, but the average operating rate was kept at 86% of rated capacity during the year. This was because some fine paper machines turned to other printing grades and newly added newsprint machines began to operate from mid-October to the year end.

Newsprint output increased to 804,680 tons (5.6%), and caused well balanced supply and demand by the installation of four machines in main producers. A new technique to use hardwood for newsprint contributed to reduce cost. Kraft paper production was 371,480 tons (up 21%); however, ever increasing demand for cement, fertilizer and foodstuffs so pressed the market that the stock dropped to only four days' use. The production of linerboard and medium board totalled 935,850 tons, a 38% increase and marked the highest annual growth rate in 1960 too.

Paper for higher quality

The need for higher quality papers is now heard in Japan. Modern machines for coating paper have been installed or are under construction by leading paper mills, and more brightness is required for newsprint and printing.

The Kushiro mill of Jujo Paper Mfg. Co. put a new giant newsprint machine into operation in 1960. Some 274 in. wide (6,960 mm), the machine has a monthly capacity of 7,500 metric tons and is now producing more than 209 metric tons/day.

To strengthen the competitive position in face of the coming trade liberalization, industrial leaders have been concentrating their efforts to cut cost by use of hardwoods and chips, and to develop new grades and types of pulp and paper for the expanding market.

Prospects for 1961

According to the recent estimate by the Japanese Government, based on long-term planning, 9% of growth rate and 15% of industrial production will be maintained during 1961. The goal of the production is 5,794,000 tons (16% up) in paper and 4,440,000 tons (14% up) in pulp. Newly built newsprint machines are expected to come into full operation this year, and the surplus for export will be about 13,230 tons. The market conditions in kraft paper and paperboard are bright and their annual production will increase by 15.6% and 21% respectively.

MOTOKI MATSUNAGA, our editor for Japan, is managing director of the Japan Pulp & Paper Association. He has traveled around the world for his industry.

India

Industry advances on broad front; 1960 active year

Population: 470,000,000. Per capita paper and paperboard consumption: 1.6 lbs. (0.75 kg)
Paper and paperboard mills: 28; grass, straw and bagasse pulp mills: 10

PRODUCTION (short tons)	1959	1960
Paper and paperboard	327,040	379,747
Chemical bamboo pulp	3,360	5,000
Mechanical pulp	20,160	25,000
Other fiber pulp	49,280	60,000
Total Pulp Production	72,800	90,000
IMPORTS-EXPORTS (short tons)	1959	1960
Paper imports	101,920	23,000
Paper imports	1,192	11,006
Pulp imports	84,000	110,000

Principal paper and paperboard imports from: Sweden, Finland, U.S.S.R.
Principal paper and paperboard exports to: Burma, Ceylon, Pakistan
Principal pulp imports from: Sweden, Canada, Finland, U.S.A.

By DR. J. C. AGGARWALA
Editor for Eastern India

—Raniganj, W. Bengal

THREE MAJOR fields of emphasis were recognized in the pulp and paper industry in India during the past year:

(1) The manufacture of pulp and paper mill machinery within India.

(2) Production of dissolving grade pulp from Indian fibrous materials.

(3) The starting of small-scale pulp-and-papermaking units (of from 5 to 10 tons capacity) in different parts of the nation.

The year 1960 climaxed a period of very steady progress and growth. The production of paper and boards has increased four-fold during the last 10 years. Apart from increase in production, special attention has been paid to the manufacture of special types of papers, including newsprint.

It is the declared policy of the

Indian government not to depend upon imports of pulp and papermaking machinery but to manufacture the same in India as far as possible. Numerous schemes for manufacture of large size pulp and paper plants as well as small-size plants are making progress. Most of the schemes are on the basis of active technical and financial collaboration between foreign and Indian entrepreneurs.

Foreign Firms Cooperate

For example, Sweden's AB Karlstads Mekaniska Werkstad (KMW) has joined hands with Tatas in India to manufacture pulp and papermaking machinery. Similarly, Bertrams of Edinburgh, Scotland, James Bertrams and Sons (also of Edinburgh) and Ernest Scott & Co., a subsidiary of Henry Balfour of Leven, Fife, Scotland, engineers, have joined together to operate a joint plant in India to build paper mill machines.

Messrs. Dorr-Oliver (India) have already started manufacturing Dorr causticizing plants and brown stock washers in India. Two Oliver washers for washing of bamboo pulp were recently delivered by Dorr, India to Messrs. Bengal Paper Mill Co. Ltd., Raniganj, and these Indian-made washers are giving satisfactory service in this paper mill. A Dorr recausticizing plant fabricated in India is at present under erection in Bengal Paper Mills.

Besides manufacture of paper machineries there is great interest to start manufacture of papermakers felts in India. One Indian-made press felt manufactured by Dinesh Woollen Mills Ltd., Baroda, was recently exhibited in a paper conference held at Dalmianagar. Government has also granted license to Dhruba Woollen Mills Ltd. for manufacturing felts. There are some schemes for manufacturing machine wires as well, and some of these schemes are being actively pursued in collaboration with foreign manufacturers.

Government has licensed numerous schemes for manufacturing dissolving-grade pulps from Indian bamboos and also from cotton linters. The total capacity of dissolving grade pulp licensed up-to-date is more than 275,000 tons per year. Some of the schemes are making good progress.

Indian government is anxious that industry should be broad-based and not concentrated in the hands of a few. In pursuance of this policy, the government is encouraging establishment of small-scale 5 to 10 tons/day papermaking units in various parts in India. Up to March 1961 licenses have already been granted to nearly 83 parties in different states for setting up small paper mills.

A new chapter has been opened in the development of Indian pulp and paper industry by decision to set up a technical association of pulp and paper industry in this country. The technical association will be IPPTA or Indian Pulp Paper Technical Association. Indian paper industry has its own peculiar problems based on use

Seven Largest Pulp And Paper Firms in India

Companies in order (tonnage in 1960):

1. Orient Paper Mills Co. Ltd., Brajrajnagar, Madhya Pradesh (58,000)
2. Rohtas Industries Ltd., Dalmianagar, Bihar (54,788)
3. Titaghur Paper Mills, Titaghur (53,291)
4. Sirpur Paper Mills, Kaghaznagar (32,186)
5. West Coast Paper Mills, Dandeli (24,862)
6. Shree Gopal Paper Mills, Yamuna Nagar, Dist. Ambala (20,576)
7. Bengal Paper Mills, Raniganj (18,064)

INDIA PAPER & PAPERBOARD ESTIMATED DEMAND

Year	*Tons*
1961-62	400,000
1965-66	700,000
1970-71	1,400,000

INDIA—THIRD 5-YEAR PLAN

	Capacity Metric Tons/ Year	*No. of Units*
Existing Capacity	410,000	28
Large Paper Units Approved for Expansion	130,300	8
Large Paper Units— Approved New Units	368,960	18
Small Paper Units Approved Expansion	12,580	3
Small Paper Units (New) Approved for Printing and Writing Papers	175,932	63
Small Paper Units (New) Approved for Specialty Papers	47,680	20
Total	1,145,452	140

INDIA—PRODUCTION, IMPORTS, AND EXPORTS

(in metric tons)

Year	*Production*	*Imports*	*Exports*
1955	184,884	67,046	2,000
1956	193,400	70,128	2,400
1957	208,957	41,508	2,450
1958	251,356	15,055	2,012
1959	294,027	17,810	1,620
1960	345,525	23,000	1,100

NEW BROWN STOCK WASHERS were recently installed at Bengal Paper Mills Ltd. in Raniganj, West Bengal, India. This particular installation washes bamboo pulp and is the first instance of using, in India, Dorr-Oliver washers manufactured within India.

DR. J. C. AGGARWALA, editor for Eastern India, is with Bengal Paper Mill Co., Ltd., on the staff of the mill manager. He headed an Indian delegation on a tour of United States this year.

of fibrous raw materials like bamboo, sabal grass, bagasse, etc.

News Highlights of India

Signs of new progress in India are exemplified by the following news of the last year:

- Fall 1961 is the target date for start-up of a new cellulose mill being built by Birla Co. in Mavoor. Major suppliers are Escher-Wyss GmbH of Germany and Svenska Fläktfabrikken of Stockholm.
- A plea by the chairman of the Indian Paper Makers Association for the relaxation by the government to permit foreign exchange for the importation of woodpulp so that the Indian mills can operate to the full limits of the efficiency and capacity.
- Opening of the new Forest Research Institute pilot plant at Dehra Dun for experimental manufacture of pulp and paper, which "can play a very important role in our national development plans."
- Crown Zellerbach Corp. (U.S.A.) technical collaboration agreement with Messrs. Rohtas Industries, Dalmianagar, for a new bagasse process. A Beloit newsprint machine here will have speed of 2500 feet per minute—fastest machine in this part of the world.
- Announcement of a new pulp-paper plant of 110 tons per day capacity being built by Indian and French interests, in the North Kanara district. Raw material: bamboo. Start-up estimate: 1962.
- Doubling of capacity at Mysore Paper Mills Ltd., Bangalore (bamboo).
- Mandya National Paper Mills Ltd., Mysore State, new mill construction with Parsons & Whittemore/Lyddon engineering, Black-Clawson Pandia continuous digester and Fourdrinier, utilizing bagasse. Producing 35 tons per day of high-grade writing and printing paper.
- A 100 tons per day bamboo pulp mill, engineered by Manderstam Lowe & Partners Ltd. of London for Assam Pulp Mills Ltd. at Kamsakhang (Assam). Cost: $11.2 million.
- Other new projects: French firm building mill in Madras to produce photographic paper. A 20,000 tons per year mill by private company in the Nilgiris in Madras at cost of $12.6 million. Seshaseyee Paper and Boards Ltd. mill in Madras State, costing $12 million, utilizing bamboo and bagasse pulp for 60 long tons per day of printing and writing papers; Parsons & Whittemore South Asia Co. directing construction.

INDIA—PAPER PRODUCTION
(in short tons)

Year	Printing and Writing	Wrapping	Paperboard	Specialties	Total
1946	71,390	17,257	20,446	7,506	116,599
1952	100,573	23,667	24,013	3,101	151,355
1953	107,103	23,144	21,853	3,830	155,930
1954	104,286	24,437	23,281	4,577	156,581
1955	133,836	31,716	35,240	6,279	207,071
1956	137,749	34,626	37,770	6,465	216,609
1957	141,111	39,738	44,850	9,643	235,341
1958	153,620	41,180	50,750	6,280	251,830
1959	197,120	61,824	61,936	6,160	327,040
1960	236,577	71,402	62,313	9,446	379,747

NEWSPRINT IN INDIA

State	Name of Mill	Location	Capacity Metric Tons/Year
Madhya Pradesh	National Newsprint & Paper Mills Ltd.	Nepanagar	30,000
	NEW UNITS LICENSED		
Maharashtra	1. Birla Gwalior Ltd.	Panwel	30,000
	2. Rohtas Industries	Karad	30,000
Punjab	3. Shree Gopal Paper Mills	Kangra Dt.	30,000

(Expansion of each of above four units to 60,000 tons/year is under consideration)

INDIA—FUTURE PULP MILLS
(Approved)

State	Name of the Mill	Location	Capacity Tons/Year
	PAPER GRADE PULP FROM BAMBOO		
Assam	1. Assam Pulp Mills Ltd.	Cachar	31,200
Gujarat	2. Central Pulp Mills Ltd.	Bangs	15,000
			46,200
	DISSOLVING PULP FROM BAMBOO		
Kerala	1. Gwalior Rayon Silk Mfg. & Wvg. Co., Ltd.	Mavoor	54,000
Mysore	2. Greater Mysore Rayon Grade Pulp & Paper Mills Ltd.	Siddalgundi	30,000
	3. National Rayon Corporation Ltd.	Nanjanged	30,000
	4. West Coast Paper Mills Ltd.	Dandeli	27,000
Assam	5. Rohtas Industries Ltd.	Badarpur	60,000
	6. Manjushree Industries Ltd.	Cachar District	54,000
			255,000
	DISSOLVING PULP FROM COTTON LINTERS		
Non-Integrated Units:			
Gujarat	1. Cellulose Products of India Ltd.	Kathwada	7,200
	2. Orient Trading Co.	Broach	3,600
Maharashtra	3. Hindustan Rayon Pulp Ltd.	—	3,600
			14,400
Integrated Units:			
Andhra Pradesh	1. Sir Silk Ltd.	Rayonpuram	3,600
Kerala	2. Travancore Rayons Ltd.	Harihar	4,800
Mysore	3. Sundatta Foods & Fibres Ltd.	Mandya	3,300
	4. Mysore Sugar Factory	Sirpur	3,300*
Maharashtra	5. Indian Rayons Corp.	—	3,600
U.P.	6. J. K. Cotton Spg. & Wvg. Mills Co. Ltd.	Kanpur	3,600
			22,200

*15,000 tons capacity in production.

Government Cooperation Cited As Vital Aid in India

By DR. R. V. BHAT
Editor for Western India

—Dandeli

The paper industry would lead the industrial sector in the Third Plan, declared Manubhai Shah, Union Minister for Industries, while inaugurating a seminar on small-scale paper manufacture at Dalmianagar in March this year.

This sums up the tremendous and spectacular progress made by this industry in the Second Plan period, thanks to the initiative and drive of Manubhai Shah, himself a qualified chemical technologist with vast practical industrial experience. This high

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achievement of the Indian paper industry is a vivid example of the close and willing cooperation between the private sector and the government and augurs well for the future of this and other industries.

The Indian paper industry reached in 1960 the high production of 345,525 tons of paper and paperboards, an all-time record.

Large Units. At present, there are 28 paper mills with a total production capacity of 410,000 tons. Eight of these units have been approved by the government for substantial expansion leading to an additional production capacity of 130,000 tons. Setting up of 18 large units with a total production capacity of 368,960 tons has been sanctioned; some of these units are expected to go into production in 1962.

Small Units. Three existing small units have been approved for expansion. This will lead to an additional production capacity of 12,580 tons. Eighty-three new small units have been licensed. Of these, 63 units with a total production capacity of 175,932 tons are for writing and printing papers and 20 units with a total production capacity of 47,680 tons are for specialty papers.

Newsprint Mills. At present, there is only one newsprint mill in India with a total production capacity of 30,000 tons. Three more units with a total capacity of 90,000 tons have been licensed. Steps are being taken to set up these new units. Expansion of each of these four units to 60,000 tons per annum is under consideration.

Board Mills. There are at present 26 paper and strawboard units with a total production capacity of 77,424 tons. The expansion of five of these units to a total production capacity of 17,400 tons has been approved. Moreover, 12 new units with a total production capacity of 36,796 tons have been licensed.

Pulp Mills. At present, there are no separate pulp mills in India. Two pulp mills—one in Assam (31,200 tons capacity) and the other in Gujerat (15,000 tons capacity)—based on bamboo have been licensed.

Rayon Pulp Mills. Six dissolving pulp mills based on bamboo have been licensed. Their total production capacity is 255,000 tons. One of them will be located in Kerala, three in Mysore State and two in Assam.

Nine dissolving pulp mills based on cotton linters or cotton waste have been licensed. Their total production capacity is 36,600 tons. Of these, six are integrated units. Some have already gone into production.

DR. R. V. BHAT, editor for Western India, was for many years officer in charge of the Cellulose and Paper Division of India's Forest Research Institute in Dehra Dun. More recently he has been works manager of the new West Coast Paper Mills at Dandeli.

Paper Converters. There are 22 units which are engaged in paper converting. Seven of these have specialized in industrial packaging. Products of other units include carbon paper, duplicating stencils, corrugated paper and board and waterproof papers.

Recent Trends in Production

The Planning Commission envisages a production target of 700,000 tons for the paper industry by the end of the Third Plan period. This is planned to be achieved not only by the expansion of the existing units and the establishment of large-scale units but also by the setting up of small-scale units of from 2 to 10 tons production capacity in different parts of the country.

Production of specialty papers is another trend in the Indian paper industry. The specialty papers being manufactured at present include cigaret paper, tissues including carbonizing tissue, greaseproof paper, art paper and boards, blue match paper, duplex and triplex boards and vulcanized fiber.

India will be the first country in the world to manufacture on a commercial scale dissolving pulp from bamboo when the approved projects are implemented in the Third Plan period.

The setting up of separate pulp mills is another new feature. The existing units are integrated pulp and paper mills.

Bamboo is the main fibrous raw material for the Indian paper industry. Second in importance is sabai grass (*Eulaliopsis binata*). The paper production has shot up to 3.5 times in the last decade and the present production is expected to be doubled by the end of the Third Plan period. Attempts are, therefore, being made to utilize new fibrous raw materials. Sugarcane bagasse occupies the top place among these.

Hardwood Pulp Desired

The advantages of the use of hardwood pulp in blend with bamboo pulp have been appreciated and some mills have started plantations of fast-growing species such as eucalyptus.

Hitherto, attention has been focussed on the technical side of the paper industry. Thanks to the National Productivity Council (NPC), an autonomous institution aided by the government of India and the Technical Cooperation Mission (TCM) of the government of the United States of America, the management aspects are receiving attention. The NPC is conducting training courses in industrial management, works organisation, etc. Training in subjects such as qualty control, works study, etc., is also imparted. Moreover, technical and managerial personnel are sent abroad for advance training under the auspices of the NPC.

China

Production is rising but falls short of demand

Population: 669,000,000. Per capita consumption: 6 lbs.
Paper and paperboard mills (machine-made paper): 25 (many hand-paper mills); pulp mills: 13

PRODUCTION (short tons)	1959	1960
Paper and board	1,930,000	2,110,000
Pulp	780,000	850,000

IMPORTS-EXPORTS (short tons)	1959	1960
Paper imports	195,000	200,000
Newsprint imports	12,300	
Newsprint exports	51,000	

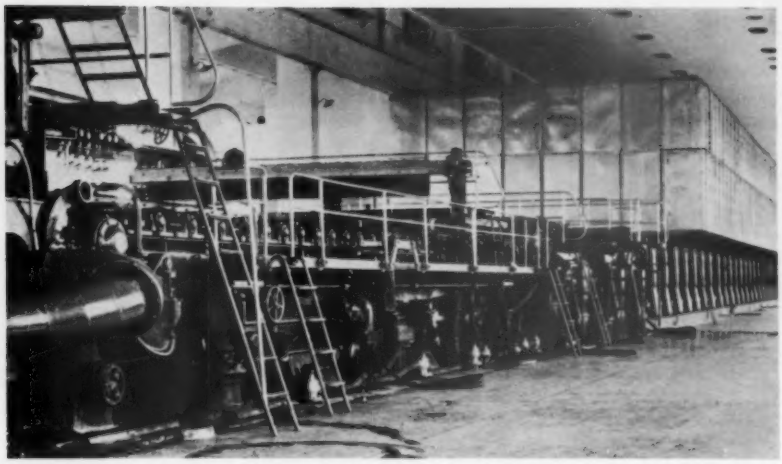
Principal paper and pulp imports from: Russia, Finland, Sweden, Norway, Poland
Principal paper exports to: Ceylon, Burma, Indonesia

—Peiping

CHINA CONTINUES to boost its production of pulp and paper under its current Five Year Plan. But despite increases, the country reportedly suffers an acute paper shortage.

In 1959, output was 2,020,000 tons, which was upped to an estimated 2,110,000 tons last year.

The lack of paper to fill domestic needs did not halt exports. In 1959, 51,000 tons of newsprint were exported, a boost of 3,500 tons over the previous year. Although no figures on 1960 exports have been released, it is reported that the government hiked



NEWSPRINT MACHINE IN CANTON, CHINA was supplied by Wartsila-koncernen of Finland. In operation since 1956, the machine has a working width of 3950 mm (154.5 in.) and capacity of 130 tons daily.

its shipments of newsprint—and other kinds of paper—principally to Asian countries.

China's paper shortage was most dramatically reflected in a cut from eight to four in the number of pages of the government's chief newspaper, *People's Daily*. In addition, the *Red Flag*, former semi-monthly publication of the Party Central Committee, is now occasionally published only monthly.

But while both publications offer fewer pages to the Chinese reader, they are being sent in greater quantities to Latin America and African countries.

China hopes to jump the gap between production and demand by an all-out effort to increase straw pulp output to 5,000,000 tons annually. A target date hasn't been announced, but, it is believed, the country's pulp and paper industry is now being mobilized for the push. New paper machines have been delivered, or are on order, from East Europe.

Despite government ownership of all facilities, competition is being fostered. The result in the case of one mill was a slash in digestion time in producing unbleached sulfite pulp from seven hours and twenty minutes to three hours and fifty-five minutes to meet the challenge of a neighboring plant.

Under its current Five-Year Plan, China intends to increase the number of its pulp mills from 13 to 39, and of its paper mills from 25 to 70 (not counting hand-made paper plants).

Greater use of reeds from river beds and straw is also expected to help boost production. Chinese reeds have been found to have a very high cellulose content—about 60% as compared with 42% for the reeds of Italy and Hungary, and 36% for those of Russia. A spokesman says that China "is projecting plans for making 5 million tons of pulp annually from straw. . . ."

China's numerous small mills still produce most of its paper; they use chiefly non-fibrous materials such as rice straw, cotton, and wheat straw. Several of them are located in Shanghai. By next year, the government hopes, these mills will be turning out 162 varieties of paper, and by 1970, 300. Their production rose 15% from 1959 to 1960.

There are some 25 large mills in the country aside from the many small hand-paper mills. Three biggest ones are at Canton, Nanking, and Kianuze.

Pakistan

Less dependence on imports as home industries grow

Population: 93,800,000. Per capita paper and paperboard consumption: 2.4 lbs.
Paper and paperboard mills: 4; woodpulp mills: 1; straw or vegetable fiber mills: 3

PRODUCTION (short tons	1959	1960
Paper and paperboard	45,129	75,781
Mechanical pulp	4,743	25,898
Straw or other vegetable fiber pulp	31,784	36,236

Principal paper grades manufactured: All kinds, newsprint, kraft, book and writing, paperboard, tissue, strawboard, corrugated board, others
Principal paper and paperboard imports from: Sweden, Canada, U.K.
Principal paper and paperboard exports to: Malaya, Singapore, Burma, Ceylon
Principal pulp imports from: Sweden, Canada

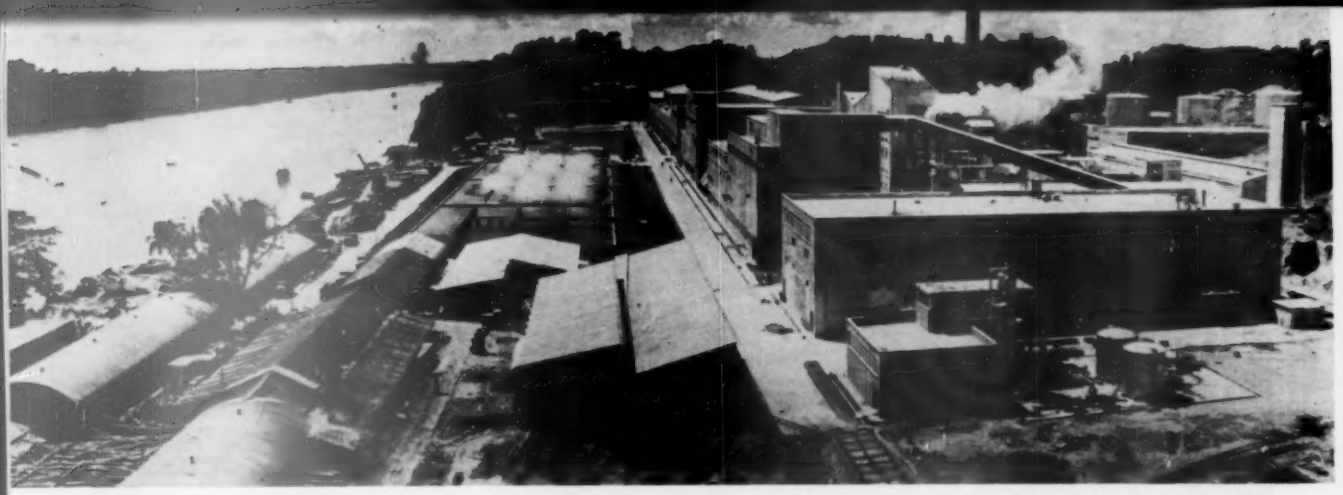
By FAKHRUDDIN AHMED
Editor for Pakistan

—Karachi

PAKISTAN'S requirements of paper are now being fully met through the existing installed capacity of its mills with the exception of wrapping paper. A wrapping paper unit is proposed to be set up in one of the currently operating paper mills to meet domestic requirements. The paper industry in Pakistan which has been wholly sponsored by the Pakistan Industrial Development Corp., has continued to make impressive gains in 1960.

The Karnaphuli Paper Mills at Chandraghona in East Pakistan has been one of the pioneering efforts in the Pakistan paper industry. It has an installed capacity of 30,000 tons per year and by the end of 1960 the mill

LOGS FOR PULP GO TO KHULNA Newsprint Mill in East Pakistan, which in 1960 produced nearly 24,000 tons of newsprint and over 6,000 tons of printing papers, making its own groundwood and chemi-groundwood pulps from "gewa," a hardwood. Some imported pulp is used.



KARNAPHULI PAPER MILLS LTD. during 1960 is the largest tonnage producer of pulp and paper in Pakistan. This general view shows the mills at Chandraghona in East Pakistan.

produced some 30,108 short tons of a variety of papers, as against 28,000 tons in 1959. The mill has been now transferred to the private sector.

The high grade board and straw mills at Nowshera and Rahwali produced 9,294 short tons and 7,254 short tons of boards (paperboard, chipboard, corrugated, kraft and laminated board) respectively in 1960.

Newsprint Quality, Volume Up

The Khulna Newsprint plant in East Pakistan is one of the most outstanding achievements in the paper industry in Pakistan. Prior to its establishment in 1959, Pakistan was almost completely dependent on imported printing papers. In 1960 the new Khulna plant produced 30,125 short tons of newsprint and mechanical printing papers. The quality of the Khulna newsprint is constantly being improved and compares favorably with imported foreign papers.

Newsprint produced by the Khulna mill is also gaining popularity and being exported to points in Southeast Asia—namely, Ceylon, Singapore, Malaya and Burma. Newsprint and various grades of groundwood specialty papers are the main products of the Khulna mill. In addition to these, the mill makes wrappers for its own use. The fibrous materials used for the purpose of papermaking are groundwood, chemi-groundwood and chemical pulps. The groundwood and chemi-ground woodpulp are made at the mill from a hardwood species named Gewa which grows in abundance in the Sundarban Forest of East Pakistan. Imported long fiber chemical pulp is used in the furnish, however.

Sandwell International, engineering firm of Vancouver, Canada, built the Khulna mill.

Private Bank Aids Industry

The Pakistan Industrial Credit and Investment Corp. Ltd. (PICIC), a privately owned industrial development bank, has also been giving assistance to a number of small units in the field of paper and cardboard for increased production. These include a small mill, the East Bengal Board Mills, which formerly made two tons of cardboard out of pulp from waste paper, but which has been expanded to a middle-sized mill producing 12 tons of cardboard and brown paper from waste paper, paddy straw and jute waste pulp.

Pakistan's forest industries have been deriving benefits from a cooperative U.S.A.-Pakistan forestry program aimed at improving logging and forestry research efforts. The two projects which have been underway are (1) the Mechanical Timber Extraction Program, which is employing modern logging methods, and (2) the East Pakistan Forest Research Laboratory, operating programs in various phases of forest products, including pulp and paper and forest management.

PAKISTAN—1960 PRODUCTION
(in short tons)

	K. Newspr.	*K.P.M.*	*Adamjee B/P Mills*	*Sethi Straw B/Mills*	*Total*
Newsprint	23,938	—	—	—	23,938
Kraft	—	4,097	—	—	4,097
Printing	—	16,613	—	—	16,613
Printing (Mechanical)	6,187	—	—	—	6,187
Writing	—	5,117	—	—	5,117
Paper Board	—	—	9,294	545	9,839
Tissue	—	246	—	—	246
Straw Board	—	—	—	4,094	4,094
Corrugated Board	—	—	—	315	315
Chip Board	—	—	—	2,154	2,154
Kraft Board	—	—	—	135	135
Laminated Board	—	—	—	2	2
Wrapping and others	—	4,034	—	10	4,044
Paper and Board Total	30,125	30,108	9,294	7,254	76,781

PAKISTAN—1960 PULP PRODUCTION AND IMPORTS

Production		*Imports*
Khulna Newsprint Mill	25,898	5,589
Karnaphuli Paper Mills Ltd.	31,497	—
Adamjee Paper/Board Mills	4,740	590
Sethi Straw Board Mills Ltd.	—	—
Total	62,134	6,179

TAIWAN—PAPER PRODUCTION
(in short tons)

	Paper	*Board*
1946	5,483	1,935
1947	9,784	4,397
1948	14,086	4,487
1949	14,646	4.520
1950	15,296	3.879
1951	18,038	5.511
1952	28,503	6,291
1953	31,829	6.659
1954	39,270	8,334
1955	45,142	11.649
1956	56,493	11,101
1957	63,511	11,209
1958	85,227	16,014
1959	100,033	26,290
1960	122,460	33,347

IN TAIWAN, young Chinese girls work on board machine and corrugator in mill of China Board & Container Co.

Taiwan

One of most enterprising pulp-paper industries in Asia

Population: 10,863,812. Per capita paper and paperboard consumption: 39.4 lbs. (18 kg.)
Paper and paperboard mills: 53; woodpulp mills: 1; straw or bagasse fiber mills: 51

PRODUCTION (short tons)	1959	1960
Paper and paperboard	126,323	155,807
Chemical woodpulp	6,119	5,227
Mechanical woodpulp	6,862	7,388
Straw or bagasse fiber pulp	130,718	161,246
Total Pulp Production	143,699	173,861

Principal paper grades manufactured: All kinds

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	7,720	6,615
Paper and paperboard exports	6,620	8,629
Pulp imports	4,410	8,820
Pulp exports (bleached bagasse pulp)	2,210	2,854

Principal paper and paperboard imports from: Japan, U.S.A.
Principal paper and paperboard exports to: South Korea, Hong Kong, South Vietnam, Thailand
Principal pulp imports from: Sweden, Finland, Canada
Principal pulp exports to: Philippines, Japan

By N. H. CHANG
Editor for Taiwan

—Taipei

TAIWAN'S PULP AND PAPER industry, one of the most enterprising in Asia, increased pulp production last year by 30,162 tons and paper and board output by 29,484 tons.

N. H. CHANG, chemical engineer at Taiwan Chung Hsing Paper Corp., Lotung Paper Mill, in Taiwan. He again has written an interesting report on his island nation for this World Review.

Pulp production was 173,861 tons, compared with 143,699 tons in 1959. Paper and board production was 155,807 tons, compared with 126,323 tons.

A total of 161,246 tons of pulp was made from straw and other vegetable fibers, 30,528 tons more than were produced in 1959 from these materials. Mechanical pulp accounted for 7,388 tons, and chemical wood pulp, 5,227 tons.

The country now has 51 straw or vegetable fiber mills (one is a market mill), and one woodpulp mill. There are 53 mills now producing paper and board.

A new plant for making white board from bleached bagasse is operating at the Hsinying Pulp Mill.

Another new mill is that of China Board & Containers, Ltd., which was completed last year at a cost of $500,000. Of this amount, $425,000 was loaned by the U.S.

Raw material used in the China Board Mill is rice straw. The straw is prepared by three cutters, then cooked in four 12-ft. grobe-type digesters.

The mill is equipped with a 72-in., four-mold, multidryer cylinder board machine, with capacity of 25 metric tons a day. The container department has a 66-in. cylinder corrugating machine for making kraft board.

More expansion

The paper industry is prominently included in Taiwan's Third Four-Year (1961 - 1964) Economic Plan. Our Ministry of Economic Affairs predicted the Gross National product can increase by 8 percent and per capita income by 4.7 percent each year with the implementation of the third plan.

Reviewing the past performance of economic development, the nation invested N.T. $6,790,000,000 (US $334,500,000) in the First Four-Year Plan and N.T. $21,300,000,000 (US $1,065,000,000) in the Second Four-Year Plan. The paper industry was included in these. The nation is prepared to invest N.T. $493,000,000,000 (US $24,650,000,000) in the Third Plan.

A key project of the program will be construction of a kraft paper mill next year. The mill, which will use bagasse pulp, probably will have a capacity of between 30 tons and 50 tons a day.

The program also calls for boosting the country's pulp supply from bagasse, bamboo, rice straw, pine, and hardwood.

Production of Bagasse

Annual production of bagasse amounts to about 1.5-million tons, but much of this is used for fuel in sugar mills.

Checking declining bamboo reserves through improved methods of cultivation and fertilization is another goal. At present, bamboo supply is insufficient to meet paper industry requirements of 50,000 tons a year. A group called the Joint Commission of Rural Reconstruction will teach cultivation techniques. But, under the program, paper mills will manage the bamboo forests. It's estimated that the new bamboo forests can be logged after four years.

Plans are under way for expanding the facilities of several paper mills. Among companies that might add new equipment are Taiwan Pulp & Paper Corp., Taiwan Chung Hsung Paper Corp., Longlived Paper Co., Kiudah Paper Co., Hwaming Paper Mill, and Daichung Paper Mill.

Several ways are being studied to improve pulpmaking. Some mills may switch from the soda to the sodium sulfite process. The industry is considering using hardwood and bamboo to produce mechanical pulp, which it believes might be cheaper than pulpwood from pine.

Currently, all dissolving and kraft

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pulp is supplied by imports. But plans are being made to make the pulp at the Hsingying Pulp Mill and the China Artificial Fibre Corp. mill from bagasse and bamboo.

Exports and Imports

Paper and board exports exceeded imports in 1960 by 2,014 tons, whereas in 1959 imports were ahead of exports by 1,100 tons.

Taiwan last year exported 8,629 tons, as compared with imports of 6,615 tons. The reverse was true in 1959, when 7,720 tons were imported, compared with 6,620 tons exported.

Last year 8,820 tons of pulp were imported, as compared with 2,854 tons shipped out. This compares with 4,410 tons imported and 2,210 tons exported in 1959.

Pulp was bought principally from Sweden, Finland, and Canada, and sold chiefly to the Philippines and Japan. Paper and board was imported mainly from Japan and the U.S., while the principal market for Taiwan's products consisted of South Korea, Hong Kong, Vietnam, and Thailand.

YOUNG READERS IN TURKEY. Walt Disney's Donald Duck comic strip offers absorbing reading for this trio of boys in Ankara. Turkey has a rising consumption of paper but still it is only in the neighborhood of 9 lbs. per person each year. (Photo by P. H. Mullen.)

Turkey

Imports severely curtailed to foster local production

Population 26,880,000. Per capital consumption: 6.6 lb.
Paper and paperboard mills: 3; woodpulp mills: 1; straw or vegetable fiber mills: 2

PRODUCTION (short tons)	1959	1960
Paper and paperboard	67,247	75,000
Chemical woodpulp	17,697	25,000
Mechanical or groundwood pulp	22,344	25,000
Straw or other vegetable fiber pulp, and rag pulp	4,000	4,000

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and board imports	44,773	50,000
Woodpulp imports	10,473	10,000

Principal paper grades made: Most kinds
Principal paper imports from: Austria, Sweden, Norway
Principal pulp imports from: Sweden, Finland

—Ankara

TURKEY IS IN THE THROES of attempting to create a self-sufficient paper industry. To achieve this goal the government is sharply restricting imports, even though domestic production as yet apparently is inadequate to meet demand. Per capita consumption dropped last year to 6.6 lb. from 8.6 lb. in 1959.

Output of paper, board, and pulp, was down in 1959 from 1958. Under mounting government pressure to increase production, however, the three state-owned Izmit mills are now filling requirements for several products.

Self-sufficiency has been attained in the manufacture of lightweight wrapping papers, bags, multi-wall sacks, toilet paper, and uncovered paperboard and boxes. The nation's three pulp mills reportedly are making nearly enough pulp to meet total demand. By next year, the country hopes to be producing all the newsprint it needs.

In many other categories, however, production is either negligible or nonexistent.

Even if the country weren't determined to build a domestic industry, it would curtail imports of several products since it is short on foreign exchange.

Products that the government considers essential will be bought in increased quantities, subject in most cases to the availability of foreign exchange. Imports of kraft paper will continue at the current rate—and possibly rise—to fill growing industrial needs. Products that will be imported in greater amounts, depending on availability of currency, include glassine, cellophane, impregnated types of paperboard, carbon paper, tabulating card paper, and tar paper, hardboard, and wallboard.

Principal paper and board exporters to Turkey are Austria, Norway, and Sweden. Pulp is imported from Sweden, Russia, and Finland. Overtures have been made to admit Turkey to the European Economic Community (Inner 6-Nation Market) and this would have an influence on future exports and imports with Italy and France especially.

Enlargement of a mill at Izmit, which is expected to push the country's total paper and board production up to 110,000 short tons, is to be completed this year.

Plans are being mapped to build two more pulp and paper mills, but they probably won't be on-stream until 1965. One would be constructed at Filyos, in northern Turkey. It would produce about 45,000 tons of kraft paper a year from a mixture of 60 per cent hardwoods and 40 per cent softwoods that would be processed in a continuous digester. The other mill would be built at Tarsus, in southern Turkey. It would make 30,000 tons a year of printing, writing, and fruit wrapping paper, and glas-

sine. It would also use continuous digesters, in which would be mixed agricultural residues such as straw and cotton, together with softwoods.

William Duryea, retired vice president of Penobscot Chemical Fibre Co. (U.S.A.), recently spent some time in Turkey as a consultant to its paper industry.

Israel

First pulp mill starts up; three paper mills expand

Population: 2,150,000. Per capita paper and paperboard consumption: 56.5 lbs. (25.7 kg.)
Paper and paperboard mills: 5; straw and cornstalk pulp mill: 1 (new)

PRODUCTION (short tons)	1959	1960
Paper and paperboard	22,800	30,000

Principal paper grades manufactured: Newsprint, kraft, sulfite, book and writing, paperboard

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	29,000	28,000
Pulp imports	21,000	21,000

Principal paper and paperboard imports from: Finland, Sweden, Norway
Principal paper and paperboard exports to: Iran, Turkey, Union of South Africa
Principal pulp imports from: Finland, Sweden, Italy

By M. KAISER
Director, Paper Division,
Ministry of Commerce & Industry

—Jerusalem

AMERICAN ISRAELI PAPER MILLS LTD. at Hadera, which in 1953 was the first paper mill to be built in Israel, now is this young country's first integrated pulp and paper operation. About one half of its furnish is the product of a new pulp mill where a continuous Pandia digester is used to process domestic cereal straw and cornstalks, followed by a Kamyr 3-stage bleach. About one half of the furnish is imported woodpulp.

Israel now has two other small mills. Supra Paper Mills started in 1960 to make toilet tissue and is using purchased pulp and waste paper. The Gveel Paper and Board Mills started in 1960 to make duplex paperboard. These products, it is hoped, may be completely supplied to Israel from local mills. Duplex board imports have been cut to 25% of requirements.

As for all grades, Israel looks to the day when it will be 60% self sufficient. The Supra Mills is starting up new equipment to make cardboard in late 1961. This will replace certain grades of cardboard, imported up to now.

Owing to the delays in completion of the $12,000,000 expansion program of American Israeli Paper Mills, our forecast for 1960 of a consumption of paper and board (imported and domestic) of over 50,000 tons and exports of an additional 18,000 tons were not realized. After a running-in period, the new AIPM pulp mill reached estimated production figures in March, 1961, so there was no production to be recorded in 1960. The pulp mill will run at 60 tons a day. Later it is to be stepped up to 100 tons.

It is planning to use other raw materials for pulping in the future. Some trials have been made with a fiber growth which is similar to the Esparto grass of North Africa, a high quality fiber for white papers in England, Scotland, France and Spain. Good results were obtained with these tests.

Trial orders of some of the woodfree fibers made here have been shipped to several countries and the results have been satisfactory.

As the local market cannot absorb the full production capacities, we are very interested in exporting surpluses. The prevailing conditions make it difficult to compete with the world market, but we hope this situation will change as the pulp mill gets into full production.

INDEPENDENT RESEARCH PROGRAM decided Israeli method of baling, handling and preparing straw and cornstalks for new pulp mill. A specially adapted Freeman Baler is shown. Bauer fractionating system is used.

New AIPM Integrated Operations

By SIMON SCHMIDT

—Tel Aviv

HAVING STARTED its new Pandia continuous pulp mill, enabling production of many more paper grades, American Israeli Paper Mills, at Hadera, is now constructing its own independent power supply. It has added research laboratories. The new installations include much electronic equipment.

The rebuild of the No. 1 Bertrams machine, and construction of the new No. 2 Beloit Yankee, permit both machines to turn out papers of 30 to 300 grams per sq. meter, including book, bond, kraft and sulfite wrapping, newsprint, manifold, tissue, fruit wrap, duplicating and offset papers. Conversion has been expanded. Assets of this company now total $20,000,000.

Investors include the Mazer family of Hudson Pulp & Paper Co. (U.S.A.) and investors in South America, Australia and Europe. The use of cereal straw and corn stalks in the new pulp mill, which is based on a soda process, is expected to save $4,000,000 annually by supplying nearly half the pulp needs.

A system of flumes floats bales of straw and stalks to the mill. Depithing and screening are required, and a Bauer Bros. (U.S.A.) fractionating method is used. The short fiber recov-

AT AMERICAN ISRAELI PAPER MILLS, No. 1 Bertrams 136 in. machine at left has new Beloit headbox and complete new Beloit No. 2 Yankee machine is at right, width 138 inches. Common stock preparation system includes two Morden Slush-Makers, seven Morden Stock-Makers, a Hydrapulper and eight Claflin refiners.

ered is added to bulk of material for the mill and the pith fraction is pressed and used as chicken litter or fuel.

A four-tube Pandia digester is followed by a Sprout, Waldron brown stock disc refiner, Cowan screens and Bauer Cleaners. Kamyr bleaching is a chlorine, caustic and two hypo towers, with intermediary washers. Stainless steel and tile linings are used. Foxboro instruments, DeZurik regulators of paddle type and Brooks rotameters are used.

Imported woodpulps (50%) are mixed ahead of machines. The stock preparation system consists of two Morden Slush-Makers, one Hydrapulper, seven Morden Stock-Makers and eight Claflin refiners, designed for maximum versatility. At a central panel board, operator also adds chemicals.

Added to the Bertrams 136 in. machine is a Beloit headbox, new smoothing press and 13 additional 5 ft. dryers. A horizontal press replaced the vertical size press, and the drive was rebuilt. A high speed Cameron rewinder was added. Screening and cleaning for this machine is by three Jonsson screens, seven Bauer cleaners and two Dirtecs.

The new No. 2 Beloit machine with a 12 ft. Yankee dryer, produces MF and MG sulfite and kraft bond, airmail and wrapping, manifold, fruit wrap, creped toilet and towel, at speeds up to 1500 ft. per minute. It is 138 inches wide. One Bird and one Jones screen, five Bauer Cleaners and two Dirtec cleaners precede it, and it has a 5,000 ft. per min. Cameron Type 460 rewinder, Additive systems are at headboxes and calender stack of both machines and at size press for No. 1. In converting there are a supercalender, tissue and towel machines and two Cameron rewinders.

Two Combustion Engineering boilers (2500 lbs. per hr.) and Brown-Boveri 12,500 kwa extraction turbine are major steam and power units.

South Korea

Newsprint scores gains as literacy rate rises

Population: 22,974,000. Per capita paper consumption: 5 lbs.

PRODUCTION (short tons)	1959	1960
Paper and paperboard	16,500	35,000
Woodpulp	7,700	11,000
IMPORTS-EXPORTS		
(short tons)	1959	1960
Paper imports	——	10,000

—Seoul

THE REPUBLIC OF KOREA has made important advances in its paper industry in recent years. Much of the progress can be attributed to the general increase in literacy throughout the nation, which has resulted in a steadily mounting demand for more newspapers, books and printed material of all kinds. Literacy is now rated at 90% as against 23% a number of years ago.

A very large share of the increased paper consumption in recent years has been supplied through imports. However, the domestic paper industry within Korea is steadily growing with the installation of new plants and equipment plus the adoption of modern technology gained from other countries.

Carl Magnus, American pulp and paper engineer who has returned to his home in Vermont (U.S.A.), was supervising consultant for much of the restoration work in rehabilitating mills in the R.O.K.

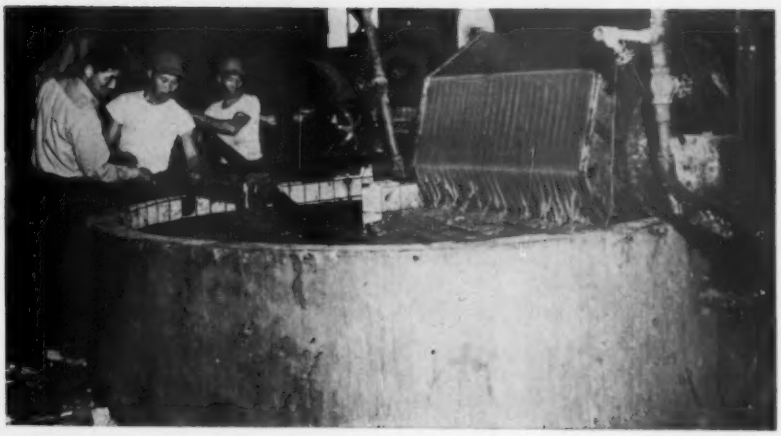
South Korea imported about 10,000 tons of paper in 1960. This figure for all grades is lower than the 11,525 tons of newsprint imports alone for 1959 but reflects, apparently, the restoration of South Korean mills which were put out of commission in the Korean war.

Newsprint is of special significance to the Republic of Korea because not only newspapers but books and other literature as well are printed on newsprint. The Korean printing industry consists of an extremely large number of publishers compared to the population, but due to rapid changes in business conditions, many of these publishers are not able to maintain continuous successful operation. (The U.S.A. State Dept. asserts, "No nation has had a greater growth in education and printing than has the Republic of Korea since the end of World War II. . . . The Americans assisted in the development of a free press by importation of thousands of tons of newsprint, and civilian experts started a mass literacy program as well as intensive development of general education.")

There are now approximately 600 publications listed with the government, including 48 dailies with a circulation of nearly 2 million.

Three major newsprint plants have been restored to operation in the country, and there are several small general paper mills with minor production tonnages. Since most of the Korea pulp sources are in Communist-held North Korea, the available forests of the R.O.K. provided only about 50% of the pulp used in 1959. The U.S.A's International Cooperation Administration has aided the R.O.K. in a reforestation program that totals 350,000 acres, but no effect from this progress will be felt until the 1970's.

DELIVERING NEWSPRINT IN KOREA, this coolie stops to rest in Seoul street. He has used more care than usual in placing the newsprint on his cart and tieing down the load but the pressman can expect some trouble and wastage.



SUPERINTENDENT SOON DONG PARK (left) observes pulp preparation in one of world's smallest newsprint mills, Chunbo Paper Co., in Sunchon, South Korea. He spent 6 months at Simpson Paper Co., U.S.A., under training grant from the U.S. International Cooperation Administration. On return, he has made improvements to double production at Chunbo.

SOUTH KOREA—NEWSPRINT
(in short tons)

	Total Imports		*Domestic*	*Total*
	ROK Govt.	*ICA*	*Production*	*Available*
1954	12,083	10,945	6,490	19,668
1955	19,406	2,728	7,480	29,680
1956	2,890	19,804	8,316	30,010
1957	3,894	10,955	8,827	23,676
1958	8,943	16,900	14,289	40,132
1959	8,050	3,476	23,338	35,083
Totals	55,266	53,958	69,740	178,306

An example of the modernization in present-day Korea is the well-engineered Sampoong Paper Mills Ltd. newsprint mill which contains new German equipment throughout. It has an Escher Wyss machine operating at 180 feet per minute and averaging 35 tons of paper per day output. The rehabilitation was carried out with U.S.A. cooperative aid funds.

The table above shows available newsprint supply through 1959.

Burma

Improved process for pulping bamboo developed

Population: 20,457,000. Per capita paper consumption (1958) 2.13 lbs.

	1960 (short tons)
Paper and paperboard imports	**25,000**

Principal paper and board imports from: United Kingdom

—Rangoon

DISCOVERY OF AN IMPROVED process for pulping bamboo could heighten interest in building a mill in this tropical southeast Asian country, which has the largest stands of bamboo in the world but which must now import nearly all the paper it needs.

A method of shredding bamboo that produces fibers with much greater surface area than those obtained by the older chipping process has been developed by the Armour Research Foundation (Illinois Institute of Technology, of Chicago), in cooperation with the Union of Burma Applied Research Institute. The shredded bamboo would be used to make easily bleachable kraft pulp.

The Burmese government is seeking financial aid to build a commercial-scale shredder. Until assistance is obtained, however, it plans to build at least one mill to make pulp from bamboo by the chipping technique.

The latest of six proposals is a plan to construct a mill in east central Burma, in which the government and an unnamed West German company would be partners.

By 1965, the government says, it plans to produce 33,000 tons of pulp a year and 11,000 tons of paper and paperboard.

It is impossible to know what the country's present paper output is since all of it comes from handmade operations along the 300-mile Chinese frontier. The paper is used chiefly for wrapping paper and umbrellas.

South Vietnam

Two paper mills being built

Population: 13,840,000. Per capita consumption of paper and paperboard: 5 lbs. (2.2 kilograms)
Mills: Several small hand-made paper mills.

	1959	1960 (short tons)
Paper and paperboard imports:	**33,154**	**29,700**

Principal paper and paperboard imports from: Japan, France, Taiwan.

By HÁ DUONG-BUU
Editor for South Vietnam

—Saigon

TWO PAPER MILLS, which are expected to fill most of the Republic of Vietnam's needs, are under way. They are being built on a new U.S.-financed, national highway, which will provide an outlet to a large area of the country.

To date the country has been supplied through scattered small hand operations and imports.

With completion of the mills, however, a fair sized domestic industry could develop. Nearly half of the republic's 65,000 square miles of land is covered with forests, comprising largely bamboo and pines. Both species are suitable for pulping.

One of the mills is being engineered by the Italian firm Sindacato Cellulosa Pomilio S.A. Pulp, therefore, would be made by the Pomilio continuous vegetable fiber process. This mill will be near Saigon, Swiss financing is involved. An Escher Wyss machine is ordered.

Paper and board imports last year totaled 29,700 short tons (27,000 metric). They came from Japan, France, and Taiwan. No figures on internal production are available.

Singapore

Island is wood center

Population: 1,634,100. Per capita paper and paperboard consumption: 42.2 lbs. (19 kg.)

IMPORTS-EXPORTS (short tons)	**1959**	**1960**
Paper and paperboard imports	**39,664**	**40,092**
Paper and paperboard exports	**3,669**	**5,615**

Principal paper and paperboard imports from: Japan, China, Finland
Principal paper and paperboard exports to: Federation of Malaya, Sarawak, Indonesia

—Singapore

THE MORE THAN 1½ million residents in this self-governing island state do

not as yet have a domestic pulp and paper industry, according to Kwoh Chao Han, permanent secretary for commerce and industry in the Government Ministry of Finance.

Lumbering is, however, one of the principal local industries, and the state is important for its relatively high consumption of paper and paperboard products. In 1960, over 40,000 tons of such products were imported into the State of Singapore, largely from Japan, China and Finland.

Malaya

Use of rubberwood may stimulate expansion

Population: 7,015,000. Per capita paper consumption: 15.5 lbs.
Number of straw or vegetable fiber mills: 1

PRODUCTION (short tons)	1959	1960
Paper and board	300	300
Straw or fiber pulp	150	150
IMPORTS-EXPORTS (short tons)	1959	1960
Paper and board imports	50,800	55,641
Waste paper imports	23,113	24,569

Principal paper and paperboard imports from: Japan, Norway, Finland, China, United Kingdom

—Kepong, Selangor

RUBBERWOOD may become an important source of pulp for unbleached and writing and printing papers and hardboard.

This appears to be the most significant development in store in this Southeast Asian federation, according to T. B. Peh, chemist for the Forest Research Institute of Malaya.

Use of rubberwood could be spurred by the integration of the rubber and paper industries, a move that has been suggested by J. D. Peel, former chemist at the Institute.

But whatever kind of material is used, the paper and pulp industry here could start growing at a brisk pace as a result of a five-year tax exemption granted new mills. Companies getting exemption certificates probably will be announced soon by the Ministry of Commerce and Industry. Then concrete expansion plans are expected to be revealed.

Several other raw materials are available for pulping. Use of padi straw and bamboo to make writing and printing papers is one project being discussed. And pineapple leaves and lalang are being considered for chemical pulping.

Malaya still has only one small, old vegetable fiber mill, which produced 300 tons of paper and board last year —the same quantity that was turned out in 1959.

Hong Kong

Important import-export hub

Population: 2,900,000. Per capita paper consumption: 49 lbs.

—Hong Kong

ONE OF ASIA'S most important trading ports, this city continues to rank among its major centers for importing and exporting paper.

With the third highest per capita paper consumption in Asia—about 50 lb. per person last year—Hong Kong imports much more paper than it ships out.

Though imports and exports dropped in the period from 1957 to 1959 it is probable both are rising again to meet increasing demand at home and in other markets.

The city's population continues to swell as refugees stream out of China only a few miles away. In addition, Hong Kong is a main supplier of newsprint and strawboard to Thailand, and of paper and board to Malaya. In both countries demand is climbing.

Mainland China provides most of the Hong King's paper. Other principal suppliers are Canada, Sweden, U.S., and Austria.

Iran

New mill will almost double paperboard and kraft paper

Population: 21,100,000. Per capita paper consumption: 5.6 lbs.
Paper and paperboard mills: 7; under construction: 1

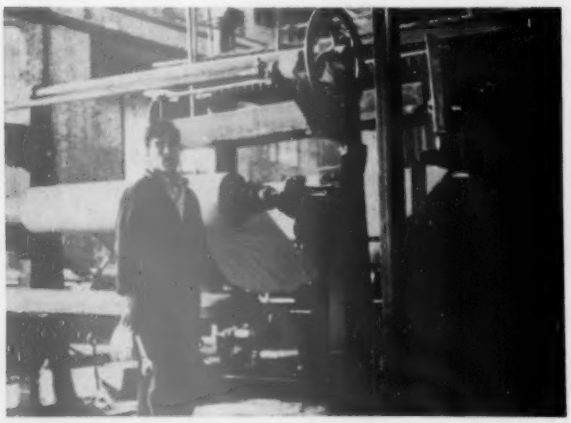
PRODUCTION (short tons)	1959	1960
Paper and paperboard	4,400	5,580
IMPORTS-EXPORTS (short tons)	1959	1960
Paper and board imports	46,000	54,800

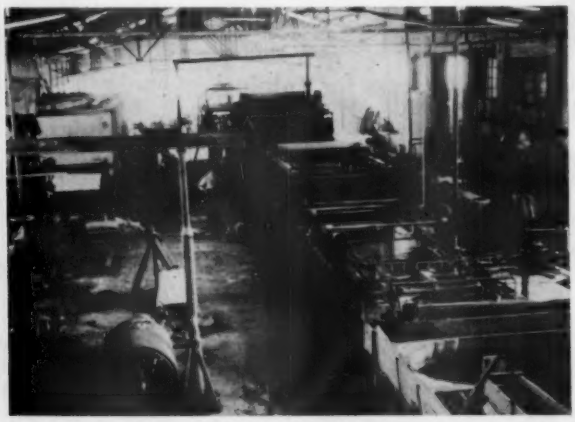
Principal paper and paperboard imports from: U.S.S.R., Sweden, Norway

By ENG. R. RAZMARA, Undersecretary Ministry of Industry & Mines

—Teheran

MACHINES NOW BEING INSTALLED in five mills will assure kraftboard and paperboard production at 9,000 tons in 1961. There are seven mills in Iran. An eighth mill, not yet in operation, will produce 4,500 tons annually. Of





IRANIAN PAPERBOARD MILL at Kahrizak, which produces 3,000 tons annually of paperboard and kraft paper.

the current paperboard production, more than half, or 3,000 tons, comes from the Kahrizak mill. Production of 80,000 metric tons (88,000 short tons) is the official goal for a Five-Year Plan (by 1965).

Paper and paperboard imports in 1959-60 were 54,800 short tons. This includes 25,000 tons of kraft bag paper, 5,000 tons of paperboard and kraft paper, and 5,200 tons of newsprint. A monetary stabilization program introduced by the government late last year is expected to reduce imports by 10% during the next two years, but allows for an increase after that time. Greater demand coupled with poor reforestation has resulted in depletions of large portions of Iran's 3 million hectares of productive forest land. To offset this, a law effective Sept. 1962 will require management plans prior to working forests. The first U.S. Commerce Dept. trade commission to Iran was conducted in December. It reported potential markets for paper bags, for cement and sugar.

Indonesia

Will have three paper mills; two were built by the Dutch

Population: 92,000,000. Per capita paper and paperboard consumption: 4 lbs. (8.8 kg.)
Paper and paperboard mills: 3; straw pulp mills: 3

PRODUCTION (short tons)	1959	1960
Paper and paperboard	6,700	7,000
Straw or other chemical pulp	4,800	5,000

Principal paper grades manufactured: Bond, bank note, writing, thin papers, cigaret and packaging

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports (combined)	95,000	110,000
Pulp imports	5,000	5,000

Principal paper and paperboard imports from: Sweden, Japan
Principal pulp imports from: Sweden, U.S.A., Japan

By ING. LIEM YOE TJIANG
Editor for Indonesia

—Jakarta

A THIRD PAPER MILL for this young independent nation and improvements and expansions of its other two mills are the major accomplishments in the national efforts to raise standards of living as a result of increasing use of paper.

Indonesia has very extensive resources and now is utilizing rice straw as a pulping raw material. Bamboo and sugar cane bagasse also will eventually be used and there are extensive pine forests available. Bagasse has been used experimentally.

ING. LIEM YOE TJIANG, 32 year old chemical engineer, consultant for the Indonesian government in the development of its pulp and paper industry, is editor for his country.

There are more than 230 millions of acres of forest lands, primarily hardwoods. Much of the hardwoods are in Borneo, and no actual survey has been made as yet of these forests. There is an estimated 130 thousand acres of pine (pinus mercusi), a highly resinous species.

The bamboo grows to cutting stage in only four years and already is used for housing or similar purposes.

Chemical engineering and other preparatory studies for pulp and paper engineers are provided at the Institute of Technology Bandung.

The first mill in Indonesia, built in the early 1920's is Padalarang, about 100 miles southeast of Jakarta, the capital. A second machine was installed in the early 1930's. These are Escher Wyss Fourdrinier machines, No. 1 is 2.15 meters wide and operating at 60 meters per minute, and making bank note, writing, bond and similar papers. No. 2 is 1.95 meters wide, producing fine papers and other thin papers, including cigaret, at 80 meters per minute. The production of the machines ranges around 14 tons per day. Rice straw pulp is made with a straight soda batch process, 10 tons per day. Some imported pulp is purchased.

The Letjes mill, built about 20 years ago, has one Fourdrinier machine, 2.3 meters wide, operating at 100 meters per minute, to make various light boards, and also government labels, packaging paper for printing, and other grades. Here also is a batch soda pulp plant making about 10 tons per day. This mill is about 800 kilometers (480 miles) east of Bandung, almost the full length of the island from Jakarta.

As concerns the third mill in Indonesia, that will be a later story.

The first two mills in our country were built by the Dutch. They are state-owned. They are now making at least 30 digerent kinds of paper.

Ceylon

Increase newsprint duty

Population: 9,612,000. Per capita paper consumption: 6.1 lbs.
Paper and paperboard mills: 1; straw pulp mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	4,696	5,000
Straw pulp	1,217	1,500

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	22,000	22,000
Woodpulp imports	3,191	

Principal paper grades made: Kraft, book and writing, paperboard
Principal paper imports from: Japan, Europe
Principal woodpulp imports from: Russia, Sweden, Canada

—Colombo

CEYLON, which started producing its own paper and board only after World War II, plans to hike its output to 5,500 short tons.

The country's one mill, operated by Eastern Paper Mills Corp., increased production by over 200% in 1959. Growth was not as impressive last year, but output is now believed to be near 5,000 tons.

To halt a decline in foreign currency holdings and protect local industry, the government early this year boosted duties on several "non-essential" imports, including newsprint. Whether the restriction will encourage expansion of the local paper industry is still a question. If the government has plans for any new mills, it hasn't announced them as yet.

Pulp is scarce, since most of the nation's tillable land must be used for producing food. Only local pulp sources are paddy straw and illuk grass (Imperatta arundiacia). Figures on last year's pulp imports have not been released by the government.

Cambodia

Survey looks to the future

Population: 4,950,000. Per capita paper and paperboard consumption: 2.6 lbs. (1 kg)
Number of straw or other vegetable fiber mills: 1 (bamboo and rice straw)

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	5,200	6,552

from: Western Europe, Scandinavia, U.S.S.R.,
Principal paper and paperboard imports Yugoslavia

—Phnom Penh

CAMBODIA'S FUTURE as a producer of commercial forest products is based on the fact that it has a relatively large forested area of valuable hardwood species. However, according to the estimates of forestry experts, the

timberlands capable of supporting a modern forestry enterprise comprise less than half the total forest area.

Reporting from the capital city of Phnom Penh, Grover Choate, forestry advisor member of the United States Operations Mission to Cambodia, states that the principal development since one year ago is the nearly completed negotiations for a long-term logging concession by the Cambodian Government. This is important since it is a marked departure from the one-year and two-year concessions granted previously for logging in Cambodia.

Although this will be a sawlog concession, the prospect that it will be granted might be of interest to pulp and paper companies contemplating investment in this part of the world.

As soon as forest survey data are available, there will be a reliable basis for granting more concessions for such large-scale operations. It is expected that the survey being conducted under the guidance of U.S.A. foresters, and similar to the National Forest Survey in the United States, will provide data on the first unit of about 9 million acres by early 1962. This area, lying in the mountains bordering the Gulf of Siam, is the most promising for large scale development. Large integrated operations with pulp and paper as a component should be feasible in this area and warrant investigation by interested firms.

A new mill is beginning production this year. It utilizes bamboo and rice straw as raw materials. Other than this new mill, there are only a few paper mills operating on a manual-labor basis. The latter are quite small in size and are located in remote parts of the country.

Lebanon

Imports remain main source of paper and paperboard

Population: 1,550,000. Per capita consumption: 23.8 lbs.

PRODUCTION (short tons)	1959	1960
Paper	600	1500

Paper imports: 17,000 tons
Principal imports from: Austria, Sweden, Finland, Russia, Czechoslovakia

—Beirut

LEBANON, perhaps the most cosmopolitan nation in the Near East, has one of its highest consumptions of paper, nearly all of which must be imported.

Paper is bought principally from Austria, Sweden, Finland, Russia, and Czechoslovakia.

Nepal

Papermakers for centuries

Population: 9,090,000. Per capita paper consumption: 2 lbs.

—Khatmandu

IN SEVERAL SMALL home-centered mills in the valleys of the Himalayas, fine papers have been made by hand here for centuries.

Virtually closed to the outside world until recently, Nepal is now endeavoring to develop its resources—among which are lush forestlands—largely with outside aid.

Although the government is offering 99-year leases on the state-owned forests, it has not yet been able to interest any group in starting a paper mill. Other factors make Nepal attractive for limited industrial development. Wages are low, while productivity of the Nepalese is high. No trade barriers exist between Nepal and India, so that the latter's ports may be used freely as shipping points.

Nepal does have two sawmills, which are producing over 200,000 cu. ft. a year of lumber. A third mill was to begin operations this year, producing 1 million cu. ft., chiefly from hardwoods.

Thailand

Opens new mill next year; boosts present production

Population: 23,750,000. Per capita consumption: 5.3 lbs.
Paper mills: 2; woodpulp mills: 1.

PRODUCTION (short tons)	1959	1960
Paper and paperboard	2,847	3,500
Chemical pulp	2,417	2,750

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	57,303	60,000
Pulp imports	52	52

Principal grades made: Book and writing papers.
Pricipal paper imports from: Japan, The Netherlands, U.K.

—Bangkok

THAILAND PLANS to open a new paper mill next year with a capacity of 40 tons a day to keep pace with soaring demand, which is expected to reach 200,000 tons by 1975.

The mill, which will be situated north of here at Bang Pa-In, will use rice straw to make paper—an ancient process in other parts of Asia, but new in Thailand.

Current requirements are about 60,000 tons a year. They are being partially met by increased production at a mill at Kanchanaburi on the River Kwei. With the assistance of a United Nations technical assistance mission, output of the mill was upped from 6.5 to 15 tons a day, without investment of additional capitol or installation of extra equipment. Eventually, it is hoped, output will be hiked to 100 tons a day.

Paper and board imports probably rose another 10,000 tons last year.

This year, the Thai Industrial Paper Corp. reportedly will buy 12,000 tons of newsprint, two-thirds of it from Japan. Besides Japan, other leading exporters to Thailand are the Netherlands, and the United Kingdom.

Iraq

Plan mill to use local reed

Population: 7,000,000. Per capita paper consumption: 7.54 lbs.

—Baghdad

A NEW IRAQ mill will produce various grades of paper and board from local reeds and grasses.

The mill would have a capacity of 40,000 tons a year, sufficient to meet present requirements.

The reeds and grasses grow thickly on 625,000 acres of land north of the city of Bassorah. It is estimated that pulp yield per acre would be four tons. Studies on pulping characteristics were conducted by l'École Française de Papeterie at Grenoble, France, and also at Stockholm.

Laos

No paper production

Population: 2,626,000. Per capita consumption: 3.5 lbs.
Paper imports, 2,000 tons.
Imports from: Hong Kong, Thailand.

—Vietiane

IT IS HIGHLY UNLIKELY that even a small pulp and paper industry will be established in this Southeast Asian kingdom—at least in the foreseeable future. The country however, has stands of several valuable woods—notably teak—which are cut for export.

Paper is imported mainly from Hong Kong and Thailand, roughly half of it newsprint.

Afghanistan

Economic expansion planned

Population: 13,130,000. Per capita paper consumption: ½ lb.
Mills: None
Imports from: U.S., Russia, India, Sweden

—Kabul

THIS MOUNTAINOUS, landlocked nation of little more than 13 million persons still has one of the lowest per capita consumptions of paper in the world. But current industrial and agricultural expansion, coupled with an anti-illiteracy drive, is expected to boost present consumption of one-half a pound per person.

There are no mills here. And, since the country has scarcely any forest land, it is doubtful that a domestic paper industry will be established. Future requirements, therefore, will largely be satisfied by imports, as they have in the past.

Chief sources of paper and board are U.S., Russia, India, and Sweden.

Cyprus

New Republic depends on imports

Population: 565,000. Per capita paper consumption: 14 lbs.

—Nicosia

THERE IS NO pulp and paper industry in Cyprus, the new nation which became a republic on August 16, 1960. According to the Ministry of Commerce & Industry, it is not considered that there are at present any possibilities for the manufacture of pulp and paper relying entirely on local forest production as the only source of raw material.

The imports which were of the most value during 1960 were newsprint, printing paper, wrapping and packaging paper, paperboard, other writing and duplicating paper. Total value of imported paper products approximated $2 million US.

The following tables present data on Cyprus imports.

CYPRUS—IMPORTS OF PAPER AND PAPERBOARD

	1959		*1960*		
	Quantity (short tons)	*Value £*	*Quantity (short tons)*	*Value £*	*Main Supplying Countries*
Newsprint paper	9.77	59,337	9.37	58,545	Sweden & Finland
Drawing and imitation art paper	—	630	—	420	
Duplicating, writing and stationery paper	—	40,311	—	40,857	Austria & U.K.
Printing paper (not incl. duplicating or gummed paper)	5.46	52,572	4.96	45,501	Sweden, U.K. & Austria
Common packing & wrapping paper	10.32	82,752	10.94	97,549	Sweden, Norway & Austria
Paperboard (cardboard)	8.18	59,208	6.84	53,242	Sweden & Italy
Building board of paper or pulp, not impregnated	6.30	25,644	5.92	25,389	Sweden
Paper and paperboard, bituminized or asphalted	8.6	3,086	9.38	4,033	Austria
Paper and paperboard, coated etc. other than bituminized or asphalted	—	28,546	—	30,920	U.K.
Wallpaper	—	6,169	—	3,754	Denmark, W. Germany & Sweden
Cigaret paper	—	6,116	—	4,721	Austria, France & U.K.
Blotting paper	—	41	—	478	U.K.
Filter paper & blocks	—	1,934	—	2,700	U.K.
Other paper & paperboard	—	32,987	—	22,482	Sweden, Norway

CYPRUS—IMPORTS OF PAPER PRODUCTS
(Value in pounds sterling)

	1959	*1960*	*From*
Paper bags, cardboard boxes and other containers	145,619	116,814	U.K. & Israel
Envelopes, paper in boxes, packets, etc.	20,224	19,478	U.K.
Exercise books, registers, albums, diaries etc.	53,201	45,404	U.K.
Serviette and handkerchiefs	7,920	9,622	Austria
Toilet paper rolls or sheets	23,502*	41,280	Norway
Articles of pulp, of paper and of paperboard, n.e.s.	98,010	93,183	U.K. & Sweden

* as from 1.5.59

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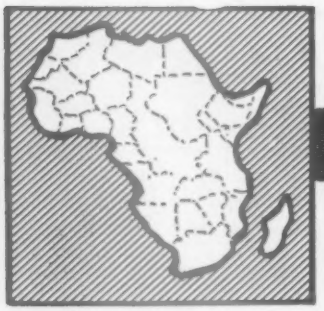


AFRICA

South Africa

Imports continue as domestic industry surges forward

Population: 15,500,000. Per capita paper and paperboard consumption: 59 lbs.
Paper and board mills: 10; woodpulp mills: 2; straw or other vegetable fiber mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	202,570	224,937
Chemical woodpulp	90,000	110,000
Mechanical pulp	1,000	2,075
Straw or other vegetable fiber pulp	20,000	26,000
Total pulp production	111,000	128,075

Principal paper grades manufactured: Newsprint, kraft, book and writing, tissue, paperboard, suitcase lining, fiber, leather board

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	200,000	228,000
Paper and paperboard exports	1,400	7,756
Pulp imports	15,000	16,800

Principal paper and paperboard imports from: U.S.A., U.K., Sweden
Principal paper and paperboard exports to: United Kingdom, other territories in Africa
Principal pulp imports from: Sweden
Dissolving pulp exports to: Italy, U.K.

By TOM MACDONALD
Editor for Republic of South Africa

—Johannesburg

THE BIG NEWS in the South African paper industry this year is the launching by South African Pulp and Paper Industries of newsprint manufacture at Enstra, Springs, near Johannesburg. Production which began in March is at the rate of from 100 to 200 tons a day, a much bigger output than the scheduled 22,000 tons a year originally planned by Sappi. The paper has already been used in the inland newspapers and its quality is first-class.

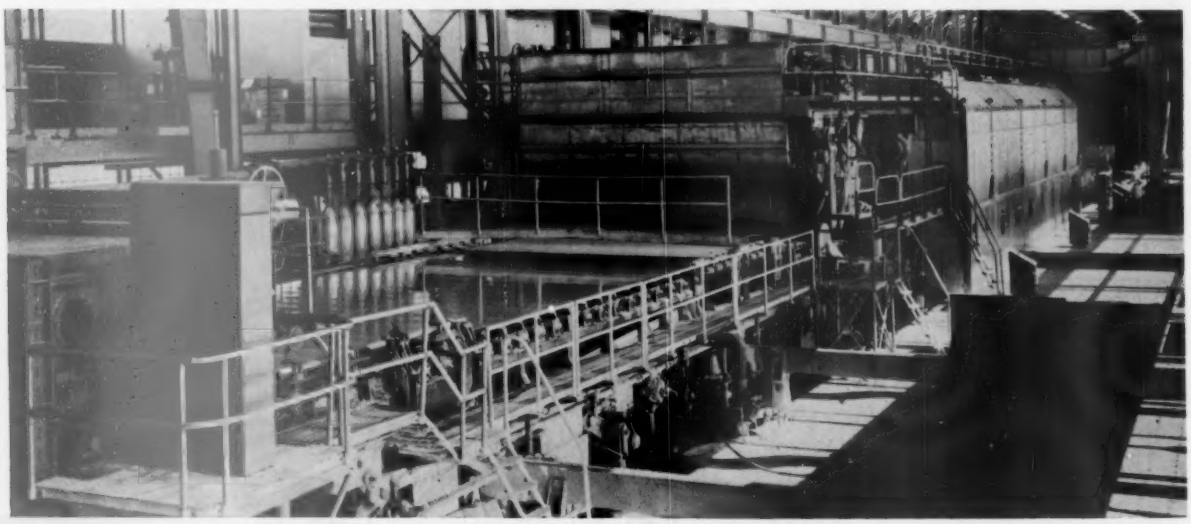
There has been a considerable increase in the use of newsprint.

With seven major projects underway and with Swedish, British, American and Canadian firms joining in the development of the paper industry, South African paper experts in 1960 visualized that by 1962 the industry would be supplying the bulk of the country's needs—except for newsprint for the coastal ports, glassine and specialty papers. Owing to rail freights, even in 1962, it will be cheaper to ship newsprint to the coastal ports from Canada and Scandinavia, than to rail it from Springs to Cape Town, Port Elizabeth or Durban.

Kraft Imports, Production Up

But the 1962 picture seems to be over-optimistic. Although production in 1960 leaped, indicating immense strides by the local industry, imports also jumped considerably compared with 1959. Here is rather a striking example: import control was tightened up on kraft linerboard, fluting and bag kraft. This was followed by a dumping duty when the local industry said it could supply the total kraft requirements of the country. Local mills stepped up kraft production but the country still had to import large quantities. Apart from newsprint the Republic is still importing about 800,000 tons of specialty papers each year.

All the paper mills reported a quite prosperous 1960, and this was a remarkable achievement in view of the fact that there were internal disturb-



SAPPI'S NEWSPRINT MACHINE IS A MAJOR FACTOR in the overall South African pulp and paper industry, because it is the culmination of a major afforestation project providing the nation's mills with its own supply of pulpwood. Installation of the Beloit Fourdrinier newsprint machine and plant equipment cost approximately $12 million. It is 580 feet long; operating at speeds up to 2,500 feet per minute, it produces between 100 and 200 tons per day.

ances and the country was bedevilled by politics. And all the mills have expansion plans. Following is an up-to-date look at the mills in the country.

Overseas Investors Active

Sappi linked with Cellulose Products, which has Swedish interests, and with Kimberly-Clark Corp. of Wisconsin, U.S.A. Cellulose makes wadding in bulk for all processes and consumers of these commodities, mainly from locally produced woodpulps. Sappi is also linked with Wiggins Teape and Co., of the United Kingdom, and Howard Smith Paper Mills of Canada.

Sappi operates large integrated paper mills at Enstra, Springs (bleached papers and kraft, printings and industrial boards), and at Tugela, Zululand (kraft papers, especially liner kraft). Sappi has a site in Cape Town for a factory but there are no immediate building plans.

Sappi is now producing whiter and brighter coated paper. By 1963, Sappi will be operating a Beloit International 185-inch trim machine at Tugela to increase the output of kraft to 400 tons per day.

Ngoye Paper Mills of Durban makes fluting for the corrugated box industry from bagasse fiber and waste paper. Linked with Ngoye is the Piet Retief Paper Mills, which is building a factory at Piet Retief, Transvaal, which likely will exploit wattle plantations by 1962.

Link with Italian Group

Premier Paper Mills of Johannesburg, using waste papers and imported pulp, makes wrappings and industrial papers. It has a mill in Salisbury, Rhodesia.

In Port Elizabeth, S.A. Adamas Fiberboard and Paper Mill is linked with the Fedrigoni group of Italy. It manufactures a variety of papers and boards, particularly wrapping papers and suitcase and kindred boards, using waste paper and imported pulp.

South African Board Mills in Durban, associated with the Stafford Mayer organization, manufactures folding and rigid cardboard. It also runs a factory at Springs, Johannesburg. The Durban plant has facilities for the manufacture of pulp, but the main materials used are waste papers with imported pulp.

In Benoni, Transvaal, Trans-African Paper Products, operates a solid board plant using mainly waste paper. In Belville, near Cape Town, Southern Paper Industries, makes tissues and wrappings.

Rail Picture Improves

A complete newcomer in the paper field this year is the Usutu Pulp Mill, Swaziland, linked with the British Colonial Development Corp. and Courtaulds. It will produce kraft pulp for overseas. Production is scheduled this July. The Swaziland transport problem will be simplified a few years hence because the protectorate is going to have a railway. Distance between Usutu and Lourenco Marques, Portuguese East Africa, which will be used by Usutu as a port, is under 100 miles.

The overall scheduled expansion in production by these mills consists of 40,000 tons of newsprint and magazine papers, 10,000 tons cardboards, 8000 tons bleached writings, printing and printers boards, 5000 tons tissues, 4000 tons coated printings and 2000 tons envelope papers. Very little expansion is planned in linerboard, fluting, wrapping, bag kraft and greaseproofs.

Annual sales of the industry is about £10,000,000. About £15,000,000 is invested in the industry.

Converting Developments

A rapidly expanding packing operation is that conducted by Amalgamated Packaging Industries, which has added new production facilities of late in Cape Town, Durban, Johannesburg, Port Elizabeth and Salisbury in Rhodesia.

St. Regis Paper Co. has become associated with two South African companies: Transvaal Box Manufacturers Ltd. and Herzberg Mullne Automatic Products Ltd., paper converters and packaging specialists. Planned developments will be aimed at building up the domestic converting industry, utilizing technology and production techniques employed by St. Regis in its operations in the United States and other countries.

Sidelights on the New Sappi Newsprint Mill

Sappi is now turning out newsprint at the Enstra mill at Springs, Johannesburg, on the 580-foot paper machine (185-inch trim), a Fourdrinier made by Beloit of Wisconsin, U.S.A. Speed is from 850 to 2500 feet per minute.

The machine is also producing other specialized papers. Output which began in March is 100 tons a day, rising to 200 tons a day when necessary.

The new plant necessitated an expansion plan costing £4 million.

Sappi was established in 1936 and is now with its mills at Enstra and Tugela, Zululand, the largest manufacturing paper concern in the Union.

When Sappi first opened, plans were for the production of bleached pulp from straw and pine and for the erection of a mill to manufacture paper from this pulp. It was not until after World War II that the company decided to modify its mill at Springs to manufacture pulp and paper from wood alone, because until then South Africa's timber sources had been very limited.

With the growth of the country's forest schemes came the Enstra plant expansion, made possible by the exotic forests which have now matured. Soil conditions and climate are such that it takes pines only about 25 years to mature.

United Arab Republic

Thirty million inhabitants offer large paper market

Population: 30,000,000. Per capita paper and paperboard consumption: 10.7 lbs.
Number of paper and paperboard mills: 8; straw or vegetable fiber mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	56,540	60,000
Straw or vegetable fiber pulp	4,000	5,000
Total Pulp Production	4,000	5,000

Principal paper grades manufactured: Kraft papers; book and writing; cigaret and fine papers; board

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	106,150	110,000
Paper and paperboard exports	4,022	4,500
Pulp imports	20,000	20,000
Pulp exports	2,000	2,000

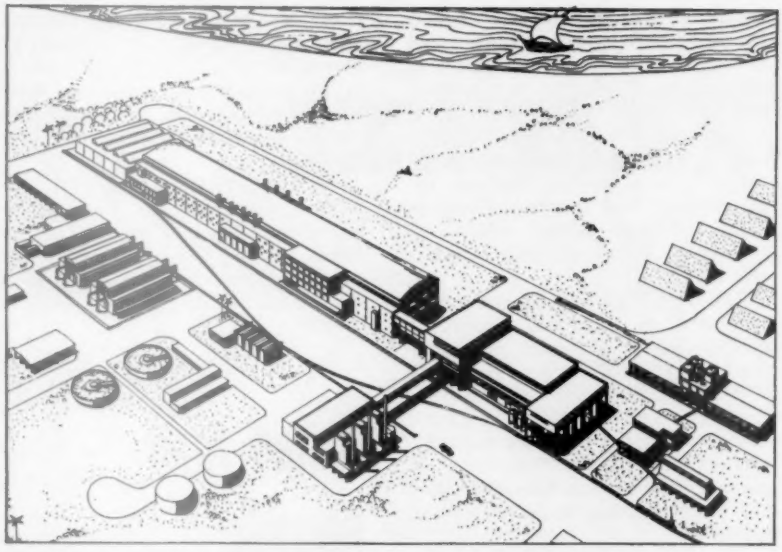
Principal paper and paperboard imports from: Finland, Sweden, Japan
Principal pulp imports from: U.S.A., Scandinavia, Czechoslovakia
Principal pulp exports to: U.K., France

By YOUSSEF FOUAD
Editor for the U.A.R.

--Alexandria

THE NEW unified Arab state formed by Egypt and Syria in 1958 is adding steadily to its pulp and paper producing capacity. There are a number of new mills projected and it is very important that a primary raw material be home-grown—rice straw and reeds.

There are over 30 million people in the U.A.R. and in the past three years there has been considerable effort to increase paper producing facilities. This will have an influence on material improvement in their lives. Commercially speaking, their increased well-being and purchasing power should be of considerable significance to other countries and the world in general.



UNITED ARAB REPUBLIC's new RAKTA mill near Alexandria.

Of these 30,000,000 about four million reside in Syria—not an industral country. It has no paper industry but consumes 11 million tons annually, about 8% of the total U.A.R. consumption.

To the six paper and paperboard mills which were operating in Egypt in 1959, three new projects have been added. There has also been expansion of existing facilities. The three new mills are:

1. Societé Générale de l'Industrie du Papier (RAKTA), 13 miles east of Alexandria, which will use straw, reeds and imported pulps to make writing and printing papers on two Escher-Wyss paper machines (editor's note: Mr. Fouad, the author of this report, is the manager at Rakta).

2. Egyptian Kraft Co., producing many grades of paper on one Fourdrinier, with a second one to be added later.

3. Al-Nasr Bagasse Pulp & Paper Co., building a 50 ton mill on the Upper Nile at Edfu. It is being built by Parsons & Whittemore largely with Black-Clawson equipment and will have a Rice Barton flash dryer.

Before these was the Attaka mill of Egyptian Fertilizer Co. which has a J. M. Voith 3,700 mm. kraft paper machine, 55 tons per day.

Already Rakta mill is considering even further expansion to make board on a cylinder machine, utilizing partly waste paper.

A German consortium provided the equipment for our new paper mill near Alexandria, the Rakta mill.

Two Escher-Wyss paper machines, Krupp digesters, Krauss-Maffei-Imperial washers and bleaching Wandel and Jonsson-screens, Bauer cleaners, Bruderhaus supercalender, Jagenberg slitters and cutters, Lentjes steam boilers and AEG generators are among principal units of equipment. Stadler Hurter International is technical consulting engineer.

The U.A.R. in 1958 has a rated production capacity of 50,000 tons per year of paper and paperboard and 4,000 tons of paper pulp. Current expansion plans call for paper and board capacities of 61,000 tons and 29,000 tons of paper pulp. The future rated capacity for U.A.R. is 110,000 tons per year of paper and paperboard and 33,000 tons of paper pulp.

There is neither present nor projected production of newsprint in the U.A.R. For Africa as a whole, the UN predicts that the present 132,000 ton deficit in the balance between normal African capacity and projected demand will still be in effect by 1965.

YOUSSEF FOUAD, editor for United Arab Republic. He is mill manager and chief engineer for the new RAKTA pulp and paper mill on the Mediterranean, east of Alexandria. He studied the use of reed and straw in papermaking at the U.S. Government's research laboratories in Peoria, Illinois.

Fed. of Rhodesia and Nyasaland

Imports and production climb; great future ahead

Population: 8,430,000. Per capita paper and paperboard consumption: 8 lbs.
Paper and paperboard mills: 2; woodpulp mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	7,500	8,000
Mechanical pulp	3,000	4,000

Principal paper grades manufactured: Fiberboard, paperboard

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	23,408	33,539
Paper and paperboard exports	118	1,454
Pulp imports	928	1,499

Principal paper and paperboard imports from: U.K., Republic of South Africa, Canada
Principal paper and paperboard exports to: U.K., Congo, Republic of South Africa
Principal pulp imports from: Canada, Norway, Sweden

—Salisbury

THE MOST IMPORTANT development in the pulp and paper industry in the Federation during the past 12 months was the announcement by managing director R. H. Annan of the Umtali Board and Paper Mills (Pvt.) Ltd. of this company's intention to manufacture newsprint. A plant costing $2.1 million (£750,000) is being installed and production will start in the second half of 1961.

Production will be low initially. It is expected that this modest production will meet most of the newsprint requirements of the Federation. When the demand is later increased, production will likewise be advanced.

To Import Swedish Pulp

The newsprint will be made from mechanically pulped softwoods from local stands of timber; 20% of the material supply will be chemical woodpulp imported from Sweden.

Umtali Board & Paper Mills is already in the production of kraftliner, cardboard, lined boxboard, chipboard and manila.

In addition to the Board & Paper proposal, there is another project in the works—a pulp and paper mill to be built at Odzi. Four firms have formed a new company—Rhodesian Cellulose Development Co.—to build the mill. They are Imperial Tobacco Co.; Snia Viscose, an Italian associate of Courtaulds of London; Cartiere Beniamino Donzelli, an Italian papermaking company; and Phillip Hill, Higginson, Erlangers, Ltd., merchant bankers.

The plant would use waste wattle trees from which the bark had been stripped, or pine trees found unsuitable for timber.

The statistics reported are estimates, because with only two mills operating, production figures are secret, particularly so because of South African competition. The Union has a big paper market in Rhodesia and the Rhodesias have an export market to the Union.

1960 Production Up At RP&PI

One of the mills, Rhodesia Pulp & Paper Industries, Ltd., is linked with the large concern of the Premier Paper Mills in South Africa. RP&PI produces wrapping paper, laminating paper for use in the tobacco industry, and fiberboard for the manufacture of suitcases. The pulp is produced from waste paper. In 1960, production at the Rhodesian mill increased by nearly 7%. New wet end and presses were installed for the paper machine. Managing director is J. W. MacKenzie.

The United States has at the moment a share of the Rhodesian market in common packing and wrapping paper, paperboard and cardboard.

Rhodesian Cellulose says it is not finished with plans for paper production even though during 1960 its ambitious £4,000,000 ($11.2 million) plan for a paper mill at Odzi, near Umtali, was scrapped. The plan was to exploit the forests in the eastern part of Southern Rhodesia, but apparently the initial optimism (of Snia Viscosa experts from Italy) of prospects in the district did not materialize.

The timber for the mill had to be brought down from the mountain by a series of canals. Moreover, initial experiments with wattle for paper production did not work out. But the Federation has vast stores of pine which are ready for exploitation.

Large Potential in Timber

It has been stated that in time the Rhodesias will be the center of a thriving paper industry because the combined forestry potential in the three territories is far greater than that of South Africa. There is an abundance of indigenous hardwoods, and eventually more than 2,000,000 acres of exotic softwood pines will be available. In Southern Rhodesia alone, private interests run 174,502 acres of exotic plantations.

Northern Rhodesia, rich in copper, has an ambitious forest program. Tropical pines and eucalypts now cover some 4,000 acres. Nyasaland is also running a big forestry program. Forests of coniferous trees are thriving in the cool, upland areas.

When the political problems are ironed out, and when the bulk of the people become literate, these Central African countries can easily become the El Dorado of the new Africa. It has been said that Northern Rhodesia with its rich copper deposits can become the richest country in all southern Africa.

Nigeria

Forestry meeting will be held here in 1961

Population: 35,000,000. Per capita paper consumption: 2 lbs.
Mills: None

—Lagos

IN THIS COUNTRY, one of the largest of the newly independent African republics, studies have been made with a view toward development of its forest resources.

Preparations are being made here for the first session of the African Forestry Commission, to be held at Ibadan, Western Nigeria, at the Federal Forestry Research Station located there, in early November.

Logging and lumbering are successfully carried out in the forested areas and it is recognized that pulp and paper will enable fuller use of resources.

Morocco

One mill makes several grades of high quality paper

Population: 10,780,000. Per capita paper consumption: 6 lbs.
Paper mills: 3
Paper production: 9,000 tons annually

—Tetuan

A SURPRISINGLY well organized and technically high standard paper mill in this "White City" of Morocco is headed by a prominent Spanish paper industry executive, Don Jose Ramon Calparsoro, who also has two mills in Spain. This mill and those in Spain are all making fine quality fine papers, bond and writing and printing.

The Kingdom of Morocco is dedicated to development of its potential industries, and pulp and paper is one of them. Since both Spanish and French Morocco were granted independence in 1956, creating one new Moslem kingdom, the growth of native industries has advanced rapidly.

The Tetuan mill management has cooperated closely with the Moroccan government and, in turn, it has received government support and encouragement. The machines in the Tetuan mill are small, but methods used trace from Sr. Calparsoro's early experiences working in German mills.

Republic of Congo

Second paper mill proposed, will aid domestic industry

Population: 14,100,000. Per capita paper and paperboard consumption: 3.2 lbs.
Paperboard mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	650	585
IMPORTS-EXPORTS		
(short tons)	1959	1960
Paper and paperboard imports	24,550	22,000
Paper and paperboard exports	221	200
Pulp imports	100	90

Principal paper and paperboard imports from: Belgium, France, Sweden, U.S.A.
Principal pulp imports from: U.S.A., U.S.S.R.

—Leopoldville

ONLY FOUR NATIONS in the world have a larger forest area than the Congo: U.S.S.R., U.S.A., Canada and Brazil. Congo has over 230 million acres of accessible forest, yet there is no pulp industry at present. The country's No. 1 paper producer is Cartonneries du Congo S.P.R.L. During the last year, despite revolutionary violence and unrest, another paper company was formed, with a capitalization of 45 million Congo francs, for the production of multi-wall bags for locally produced cement, flour and coffee.

Pulp for the proposed mill would be imported (soda kraft pulp), but it is planned that a mill would be built at a latter date to provide a portion of the pulp for the paper plant.

Reliable information concerning the state of the industry has been difficult to obtain during the last year. However, with its large population (third greatest in Africa) and vast storehouse of natural resources, Congo must be counted as an increasingly important factor in the long-term picture of a pulp and paper industry on the African continent.

It is reported that many businesses disrupted in the Congo during political troubles here nevertheless remained in operation.

dustrial. Use of wood for industrial purposes in North America is, per capita, 24 times more than in Afrca, while newsprint use is per capita some 50 times more. African countries realize the need for reducing this gap, and are calling upon the more developed areas of the world to help."

Ghana

Development group plans pulp and paper production

Population: 5,200,000. Per capita consumption of paper and paperboard: 2 lbs.
Paper mills: 1

PRODUCTION (short tons)	1959	1960
Paper production	300	350
IMPORTS-EXPORTS		
(short tons)	1959	1960
Paper imports	2,982	4,800

Principal paper imports from: U.K., Finland, Sweden, West Germany

—Accra

THE GHANA INDUSTRIAL Development Corp. in Accra is planning to establish an integrated operation in Western Ghana, utilizing the extensive timber resources of this country for wood pulp and paper products.

In this four-year old republic, there already is a small paper mill, which utilizes waste paper only as raw material, and production is very small. It is the only mill in this western part of Africa.

But Ghana has over 90,000 square miles of forests and while only about one-third is easily accessible, it already is being developed for lumber and wood products. European loggers and lumber experts have assisted the Ghanians in this enterprise. Some wood and lumber is exported by African Timber & Plywood Ltd.

"Developing Africa presents one of the greatest challenges to world forestry today," said Vinton Burns, regional forestry officer for Africa, of the United Nations Food and Agricultural Organization (FAO) when he recently visited Ghana.

"African forests must be safeguarded," he said. "Increasing imports of forest products into African countries point towards the need also for greater utilization of this renewable natural resource."

Mr. Burns, a graduate of the Oxford School of Forestry, has been on FAO's field staff since 1951, working in the Caribbean, Latin America and Asia.

"More than three times as much roundwood is used by the average North American than by the average African," he continued. "This includes all uses—fuelwood, building and industrial. Use of wood for industrial purposes in North America is, per capita, 24 times more than in Afrca, while newsprint use is per capita some 50 times more. African countries realize the need for reducing this gap, and are calling upon the more developed areas of the world to help."

British So. Africa

New unbleached sulfate pulp mill to start up

Population: 1,250,000. Per capita paper and paperboard consumption: ½ lb.
Principal paper and paperboard imports from: Republic of South Africa

—Mbabane, Swaziland

OCCUPYING nearly 300,000 square miles and with a population of over 1¼ million persons in its widely separated territories, British South Africa has large-scale artificial forests which this year will begin supplying a brand-new large pulp mill.

The Government Secretary of The Secretariat of the Swaziland territory reports that the construction of the Usutu Pulp Co.'s mill for the manufacture of unbleached sulfate pulp is expected to be complete by August, 1961. The erection of the new plant was begun in March of 1960.

The mill is located in the mountainous western region of Swaziland. It is being built on the north bank of the Great Usutu River at a site near to the center of the extensive man-made Usutu Forests from which the mill will draw its raw material.

The mill is designed to produce 100,000 tons per year of pulp and incorporates the most up-to-date techniques, including continuous digesting.

In addition to a direct total investment in the project of more than 20 million Rand by the company's British shareholders, the Swaziland Government is also undertaking extensive public works for the provision and improvement of communications, including the building of 17 miles of new road.

Sales of pulp are expected to be in the United Kingdom and Western Europe. One of the first major problems to be solved was transport which must involve road and rail haulage to the port of Lourenco Marques before ocean freighting to Europe.

In the Bechuanaland Protectorate, the Department of Agriculture reports from Mahalapye that at present no pulp and paper manufacture is being carried on in this territory. Principal paper and paperboard imports come from the Union of South Africa and to a lesser degree from the Central African Federation of Rhodesia and Nyasaland, although no specific figures as to tonnage are available.

Uganda

Potentials for paper studied

Population: 6,536,616. Per capita consumption of paper and paperboard: 1.5 lbs.
Mills: None
IMPORTS-EXPORTS
Imports of paper and paper products: 6,000 tons (approx.)
Imports of building board: 1,664,029 sq. ft. (1959)
Principal paper imports from: Norway, U.K., Canada, Sweden
Principal building board imports from: Sweden, Finland, Belgium

By E. N. GHOSLEY

—Kampala

THERE IS NO pulp or paper industry as yet in Uganda, but the potentials of this mid-African country have been examined. Eucalyptus is suitable for pulping but is not at present in sufficient supply to support a mill. Both papyrus and bamboo are available but present harvesting difficulties.

In 1959 Uganda imported 1,911 tons of various grades of paper, 2,290 tons of converted paper, and in addition, 1,664,029 sq. ft. of building board of paper or pulp, not impregnated. The figure for paper imports includes 28 tons of asphalted or impregnated board. Major imports were newsprint, 551 tons, other printing papers and writing, 772 tons, paper bags and cardboard boxes, 389 tons from South Africa and Europe. Uganda imported 232 tons of exercise books, diaries, memo books, registers and albums from Europe. The value of these imports totaled over 370,000 pounds sterling.

Norway, Canada and U.K. were chief suppliers of newsprint in that order. For other printing and writing, U.K., Norway and Austria. For paper bags and boxes, South Africa, Sweden and U.K. Books and envelopes, mostly from U.K., and building board from Sweden and Finland chiefly.

From neighboring Kenya, Uganda imported 1,679 tons of converted papers, mostly cardboard boxes and bags. The value of imports from Kenya was about 200,000 pounds sterling. Thus, value of all paper and paper products imported was about 570,000 pounds sterling.

Libya

One mill operating

Population: 1,200,000. Per capita paper and paperboard consumption: 7.5 lbs.
Number of paper and paperboard mills: Vegetable fiber mills: 1; paper mill: 1

PRODUCTION (short tons)	1959	1960
Paper	2,200	1,855

Paper grades manufactured: Wrapping, bag paper

IMPORTS-EXPORTS (short tons)	1960
Paper and paperboard imports	4,400 (est.)

Principal paper and paperboard imports from: Italy, U.K., Germany
Esparto grass exports to: U.K.

By L. G. JOWETT
Editor for Libya

—Tripoli

LOCAL PRODUCTION of paper in Libya consists of the output of one mill located in Tripoli. It produced 1,850 tons of paper in 1960. The potential capacity of slightly over 13 tons per day. Products made are wrapping paper and bags from domestic fibers.

Exports of esparto grass have declined in quantity owing to the necessary reducing of output, to prevent over-cropping, and in value, owing to the lower prices in the overseas markets. The United Kingdom is the major importer of esparto grass—used in manufacture of bank notes and other fine papers.

Libya's paper imports for 1959 were valued at $777,255, according to Department of Economics data (editor's note: Mr. Jowett is director of marketing and industries in the Department of Economics). A total of 467 metric tons of newsprint was included in the imports, representing less than one-fourth of the total value of paper imports.

Sudan

Three mills planned, two will use papyrus

Population: 11,615,000. Per capita paper consumption: 2.4 lbs.
Paperboard mills, 1.

	1959	1960
	(short tons)	
Paper and paperboard production	1,595	2,232

Principal imports from: United Kingdom, Egypt, Norway.

—Khartoum

PLANS ARE BEING finalized to build three mills, total production of which will be 29,000 tons a year of paper and paperboard. Two of the mills will use papyrus—which grows in abundance in this large African country—and the other will use principally cotton stalks.

The mill to make pulp from cotton stalks may already be under way. A government venture, the mill has been designed by Yugoslavian paper experts. Site is Aroma, in the Kassala area, a fertile region in central Sudan noted for its cotton production. It will turn out paperboard at a rate of 4,000 tons a year.

The latest mill planned is that of Arabian Paper Manufacturing Co., to make 9,000 tons of paper annually from papyrus pulp.

The third mill will be built by Two Niles Cellulose & Paper Manufacturing Co. at Molokal. Original plans called for capacity of 8,600 tons, which has now been increased to 16,000 tons. It will make all types of paper.

Papyrus will be cut in a 5,000-square-mile area south of Lake No, which is covered with the tough, reed-like grass. The area, a vast rainland, reportedly would produce a harvest of 150 million tons, or up to 40 tons per acre. Quick growing, the grass can be harvested as often as three times a year.

An ancient papermaking material, papyrus has been found to be a good commercial source of pulp. Harvesting and transportation problems apparently, have now been solved.

In addition to the three major mills, two wrapping paper plants will be opened.

Blue Nile Packaging Co., Ltd., now makes kraft and brown papers as well as corrugated boxes, at its plant here.

Sierra Leone

New country in Africa has extensive forests

Population: 2,500,000. Per capita paper and paperboard consumption: .1 lb.
Mills: none.

—Freetown

STILL BLINKING its eyes at its new found independence (last Apr. 27) after more than 175 years as a British colony, Sierra Leone has not had much time to think of a pulp and paper industry. In fact, right now it has none. Its land area of some 7,200,000 hectares is covered with only some 290,000 hectares of forests, or about 16%. Studies are being made for development and use of these forests. Most of this land (257,000 hectares) is state owned and almost 100% is tropical rain forests.

Situated on the west coast of Africa for 210 miles between Guinea and Liberia, Sierra Leone's principal products are iron ore, hides, rice, piassava and kolanuts, palm kernels, chrome ore, gold and diamonds. This capital city of Freetown has one of the finest seaports in West Africa with an excellent harbor.

Somalia Republic

Agriculture fibers hold potential for future

Population: 2,500,000. Per capita paper consumption: ½ lb.

IMPORTS-EXPORTS (short tons)	1959
Paper imports	1000

—Mogadishu

THE MINISTER of agriculture and zoology of this new nation (as of July 1, 1960) reported no present or prospective paper manufacturing operations here. However, the Somalia Republic is another of the many new nations of Africa which have won their freedom and independence, yet still lean heavily on Western nations for their economic stability. Largely agricultural, Somalia depends upon outside aid from such countries as Italy, Great Britain and U.S.A.

Somalia's agriculture includes the growing of sugar, and hence the possibility of furnishing raw material for a fiber plant. Somalia does have forests, but its trees are slow-growing hardwoods that do not lend themselves to forestry operations for pulpwood. A local timber industry provides wood for construction and furniture purposes. Gum rubber is another important product.

Portuguese Africa

Paper project for Angola

Population: 13,500,000. Per capita paper and paperboard consumption: 2 lbs.
Mills: None

—Luanda

DESPITE THE UNREST and political and racial problems of Angola, there is still a project for a pulp and paper mill at Alto Catumbela. Compagnia de Celulosa de Ultramar is the projected company and the mill would produce

at the outset about 16,500 tons of woodpulp, using native woods, and another 3 or 4 thousand tons per year from agricultural residues. Paper grades, at the beginning, would be made from at least one-half of this pulp production.

Cape Verde Islands, Mozambique, Portuguese Guinea and Sao Tome and Principe are other Portuguese territories in Africa. The total area is nearly 800 thousand sq. miles, with more than one-half of it in Angola. Portuguese interests are continuing to investigate the paper making possibilities in these areas.

Liberia

Resources await development

Population: 2,500,000. Per capita paper consumption: 0.6

	1959	1960
	(short tons)	
Paper and paperboard imports:	750	537

Principal paper and board imports from: U.S., West Germany, Sweden

—Monrovia

MORE THAN 9 million acres of forest hold vast possibilities for pulp and paper production.

This independent republic on the southwestern coast of Africa has 250 species of trees, many of which are suitable for pulping. Estimated potential yield is 2 billion bd. ft. per year from virgin timber estimated at 140 billion bd. ft.

French West Africa

100,000 tons a year goal of new mill

Population: 18,934,000. Per capita consumption: 1.5 lbs.
Principal paper imports from: France, Sweden, Morocco
Principal paper exports to: France, Republic of the Congo

—Dakar

PRODUCTION of 100,000 tons a year of bleached pulp and paper is the target of a new mill that is to start operations this year. The mill, the country's first, will be at Bimbresso.

Plans call for initial output of 36,000 tons.

At the outset raw materials will be imported, but toward the end of the year local pulp will be used.

Ethiopia

Timber and power abound; new mill is being planned

Population: 21,400,000. Per capita consumption of paper and paperboard: 0.5 lb.
Paper mills: 2

PRODUCTION (short tons)	1959	1960
Paper and paperboard	237	325
IMPORTS-EXPORTS		
(short tons)	1959	1960
Paper and paperboard	2,600	3,000

Principal paper and paperboard imports from: Italy, U.K., Sweden

—Addis Ababa

IN THIS POTENTIALLY RICH African kingdom, one of the world's oldest Christian nations (Mohammedans are a minority), there is a great variety of resources. Fauna, flora and climatic conditions are as varied as anywhere in Africa with distinct regions of mountain lands, plains and low deserts.

There are two small paper mills now in operation, which produce wrapping paper and paperboard, reports Assefa Difaye, assistant minister of commerce and industry of the Ethiopian Imperial government. A new mill to make use of the eucalyptus trees and castor plants is being planned, he said. It is to start operations in 1964.

Present annual consumption of paper is around 3,200 metric tons (3,520 short tons) and is increasing at the rate of 15% yearly, said Mr. Difaye.

Eritrea, former Italian colony, to the north, is now federated with Ethiopia.

Republic of Upper Volta

New republic

Population: 3,520,338. Per capita paper and paperboard consumption: 0.63 lbs.

IMPORTS-EXPORTS (short tons)	1960
Paper and paperboard imports	1,100

Principal paper and paperboard imports from: France, Sweden

—Ouagadougou

THREE AND A HALF MILLION persons live in this nation, which is one of the former French possessions becoming independent in 1960. Wood is one of the principal natural resources, although no pulp is produced at present. Paper imports amounting to approximately 1,100 tons are shipped in, chiefly from Sweden and France.

Rest of Africa

New nations comprise vast potential market

Population: 40,000,000. Per capita consumption: 1.5 lbs.

THE REMAINING COUNTRIES of Africa, most of which have just recently won their independence, could become important future pulp and paper markets. Still largely backward by Western standards, these new African nations are instituting programs of industrialization and social reform, which should create a steadily rising demand for all kinds of paper and paper products. By 1965, Africa's paper demand will be an estimated 2,178,000 tons, and by 1975, 4,664,000 tons, according to the FAO, United Nations.

G. G. Watterson, FAO, United Nations regional forestry officer for Africa, advises this magazine that pulp and paper "will certainly be in the news soon" in Africa, as several simultaneous possible developments are being studied.

Tentative projects for pulp and paper, he said, would utilize bamboo in Ivory Coast, eucalyptus *saligna* in Angola, a mixture of Brachystegia woodlands and ecualyptus in Tanganyika, thinnings from plantations of Ancoumea in Gabon, wattle and conifer plantations in Kenya, etc.

He specifically mentioned a German project for 5,000 tons annually of pulp and paper in Ethiopia using eucalyptus with mixtures of Podocarpus and castor-plant, but water shortages are holding it up. He said that Cameroon has asked for a UN survey with a view to launching a pulp project.

There are 950,400,000 acres of accessible forest land on the African continent, according to the Food & Agricultural Organization of the United Nations. This is more forest land than exists on any other continent, except North America, which has only a trifle more accessible acreage. And Africa has nearly as much forest land now described as "inaccessible" by the UN group. As transportation facilities are built into the backlands, however, this "inaccessible" land will be topped.

What will be done with most of this wood is still a big question. Many species of African trees are unsuitable for making pulp, but—like mahogany, ebony, and teak—have great value for other uses. On the other hand, Africa grows many kinds of pine and other wood, which are fit for pulping.

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ASD-238

LATIN AMERICA

Expansion in pulp and paper is part of the over-all economic growth picture in Latin America. In nearly all major countries, rising demand is sparking construction of new facilities and a boost in imports.

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OCEANIA

The industry is expanding "Down Under." New Zealand will double production capacity in 10 years. Australia, despite tight credit, continues expansions. Philippines schedule 8 new mills.

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RISING LITERACY, typified by Bolivian Indian, means more paper use.

LATIN AMERICA

Mexico

Sharp rise in production and consumption of paper

Population: 35,000,000. Per capita paper and paperboard consumption: 32.1 lbs. (14.4 kg) Paper and paperboard mills: 40; woodpulp mills: 9; straw or other vegetable fiber mills: 8

PRODUCTION (short tons)	1959	1960
Paper and paperboard	420,000	450,000
Chemical woodpulp	156,000	164,000
Mechanical pulp	36,000	56,000
Straw or other vegetable fiber pulp	33,000	40,000
Total Pulp Production	225,000	260,000

Paper grades manufactured: All kinds

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	76,000	113,000
Pulp imports	28,000	33,000

Principal paper and paperboard imports from: U.S.A., Canada, Finland

Principal pulp imports from: U.S.A., Canada, Sweden, Finland

By CARLOS GARCIA ROBLES
Editor for Mexico

—Mexico City

THIS PAST YEAR has seen again a sharp rise both in production and consumption of paper and paperboard in Mexico—greater than the normal annual increases. Two new mills, both manufacturing paper and board, started operations during 1960, one at the end of April and the other at the end of the year. Although they have installed capacity of about 38,000 tons per year, they actually contributed only about 4,000 tons to the general rise in production during their partial start-up year.

Mexico is a fast growing paper market because its population growth rate is one of the highest in the world. A campaign to increase literacy is bearing fruit. The population already has reached the 35 million mark.

Paper and paperboard production now is estimated at 450,000 tons and total pulp production of all kinds is 260,000 tons. Pulp production has been greatly increased, with protection and assistance from the government; but even so, pulp imports have risen slightly each year since 1957, although the current figure of 33,000 tons is only about 60% of what imports were in the early 1950s. Production of pulp has more than trebled in ten years.

The decision of several important consumers to utilize polyethylene bags for their product instead of cardboard boxes has brought about a temporary setback to the paperboard mills until their ingenuity finds new uses for their products.

The trend toward self-sufficiency in Mexico has been brought very sharply to the attention of everyone connected with the paper industry by the opening of felt and wire manufacturing plants and the successful launching of a Technical Association along lines similar to the American TAPPI.

It is also very significant that, of the total paper imports of 113,000 short tons, about 108,000 tons are newsprint alone. The balance is made up of speciality papers which on account of their small volume are uneconomical to manufacture. Therefore, a new low in imports of papers other than newsprint has been reached in 1960.

Empaques de Cartón Titán S.A.

This ever-progressive mill at Monterrey started a continuous straw pulp plant producing unbleached pulp from wheat straw. Parsons & Whittemore of New York were the main suppliers under a "package deal" with start-up assistance. Main items include a 65 short tons daily capacity Pandia continuous digester with two 42 inch digester tubes, chemical supply pumps and blow tank. The unbleached pulp is used for corrugating medium. Titán also recently installed a new Sandy Hill paper machine.

Cartonera SAGO, S.A.

This new mill, located at Atizapan de Zaragoza, state of Mexico, having an installed capacity of about 5,000 short tons per year, was started successfully in late April 1960, manufacturing mainly high quality folding boxboard. It has a preparation system designed for four stocks served by two Fibrella pulpers and two home-made

LENZ TIRADO HERNANDEZ SANA LETH

LEADERS IN MEXICO'S technical association sit at head table at a recent meeting of the new Asociacion Mexicana de Tecnicos de las Industrias de la Celulosa y del Papel A.C.: Hans Lenz, president of Loreto y Peña Pobre S.A.; Adalberto Tirado, president of the association and also technical director at Loreto y Peña Pobre; Hector Hernandez, director of the Board of Commerce (Mexican Govt.); José Saña, joint managing director (with Fernando de la Macorra) of the San Rafael Paper Mill and subsidiary companies; Aage M. Leth, secretary and treasurer of the technical society, and also technical supervisor with Celulosa de Chihuahua S.A.

THESE PICTURES show the typical sawtooth facade, and thin shell roofing of construction in Mexico. Both styles are used in plant buildings shown here of the new Empaques Modernos San Pablo, put into operation in the past year.

ones; four Jones No. 1 and a Wiener refiner, together with an Emerson jordan. The 7-vat machine trimming 63 inches has three press sections and 34 dryers, two machine calenders, reel and winder. A Hurletron caliper and weight control takes care of the caliper of the sheet.

Sandalio Gómez is president of the company with Félix Sordo acting as general manager and Bienvenido Ulloa as production manager. The writer was responsible for the entire mill layout and civil engineering work.

Empaques Modernos San Pablo

This new mill was built last year near Mexico City. Luis Gonzáles Diez is general manager. It makes linerboard, boxboard and corrulating medium, 120 tons per day. Much of the stock preparation is by Black-Clawson. A second-hand Downingtown 90-inch trim wet end is followed by new Manchester Machine press section and Downingtown dryers with Ross Engineering air system.

Albany Nordiska de México

On Nov. 11, 1960, the above company opened its doors to about 400 guests from every industry, government circles and banking officials. This company was formed by Albany Felt Co., Albany, N.Y., U.S.A., and Nordiska Maskinfilt Aktiebolaget of Sweden. The plant, located at Cuautitlán, State of Mexico, is about 25 miles from Mexico City on a plot of ground which has plenty of room for future expansion and is easily reached by road and railway.

Wangner de México, S.A.

With the technical and material help of Hermann Wangner, Reutlingen, West Germany, the first Mexican wire factory and second in Latin America started its manufacturing program in May, last year. The plant was built in the outskirts of Mexico City about eight miles to the southeast.

Besides wire-drawing equipment and annealing furnace, the mill has five looms for the wider Fourdrinier wires and two smaller ones for the open wires in the narrower cylinder moulds. The widest loom is good for a 189 inch wire, being able to cover all the existing wire widths in Mexico. The writer's firm is their sales agent.

Technical Association

Asociacion Mexicana de Tecnicos de las Industrias de la Celulosa y del Papel, A. C. was formed by a group of technical men.

In the first general meeting August 17, Adalberto Tirado of Loreto y Peña Pobre mills, was elected president.

Important contributors to the increased production in Mexico in 1960 were the expansions at the San Rafael mill, the largest in the country, and the new San Cristobal bagasse pulp and paper mill, which took place in 1959. At San Rafael, the new Dörries No. 11 machine, built in West Germany, marked a major addition in Mexico. The San Cristobal mill uses the Cusi pulping process and it added a second new Beloit machine. Scott Paper Co. is a partner with Dr. Alessandro Cusi in this company.

The statistics for Mexico were obtained for this WORLD REVIEW NUMBER as reliable estimates of 1960 production by the Mexican Paper Industry's own Chamber of Commerce. I wish to thank them for their assistance.

CARLOS GARCIA ROBLES, editor for Mexico, is a pulp and paper consulting engineer and representative for market pulp and machinery companies of Europe and U.S.A.

MEXICO—PAPER CONSUMED

(in thousands of short tons)

	Printing* (no news)	Writing & Fine	Coarse & Wrap	Tissue	Paper Board	Total (Includes others)
1948	20	23	59	7	47	165
1949	19	27	60	8	49	171
1950	25	32	75	12	54	209
1951	29	36	78	16	57	226
1952	29	33	76	15	63	230
1953	30	35	79	18	68	250
1954	28	38	80	22	71	260
1955	32	45	106	22	92	338
1956	48	64	131	22	97	415
1957	56	55	153	12	91	453
1958	58	61	168	13	100	480
1959	60	66	163	13	104	496
1960	68	78	186	14	86	563

* Mexico imported 36,971 tons of newsprint in 1955; 51,557 tons in 1956; 85,000 in 1957; 80,000 in 1958; 95,000 in 1959; and 108,000 in 1960.

MEXICO—PAPER PRODUCED

(in thousands of short tons)

	Printing* (no news)	Writing & Fine	Coarse & Wrap	Tissue	Paper Board	Total (Includes others)
1948	17	20	54	4	44	147
1949	18	23	58	5	49	156
1950	22	25	52	4	45	150
1951	27	35	77	13	56	217
1952	25	30	70	2	60	198
1953	26	31	75	0	63	201
1954	23	33	78	2	67	207
1955	31	43	105	3	90	274
1956	46	61	130	4	96	346
1957	54	52	152	12	86	357
1958	56	59	164	13	97	400
1959	58	64	162	13	102	420
1960	68	76	186	14	86	450

* There was no newsprint made in Mexico until 1958.

MEXICO—WOODPULP

(in short tons)

	Produced	Imported
1937	18,636	
1946	27,010	
1947	56,314	
1948	78,880	32,933
1949	71,500	45,000
1950	77,000	56,500
1951	94,000	56,000
1952	90,000	60,000
1953	92,000	54,000
1954	96,000	44,000
1946	27,010	
1955	148,000	46,000
1956	174,000	39,000
1957	218,000	25,000
1958	220,000	27,000
1959	225,000	28,000
1960	260,000	33,000

Paper Mill is Projected For Mexico's Chihuahua Company

Chihuahua, Mex. . . . Plans have been drawn more definitely for the addition of a paper mill to the present kraft mill operation at Cellulosa de Chihuahua S. A.

This mill has been selling its pulp on the market, but for many months it has been known that a paper machine is planned. Confirmation that bids have gone out comes from American machinery builders.

The Chihuahua mill was built several years ago by Snia Viscosa, Italian engineering and dissolving pulp firm.

Chile

Paper is specific target of 10-year $10 billion program

Population: 7,550,991. Per capita paper and paperboard consumption: 20.5 lbs. (9.3 kg.) Number of paper and paperboard mills: 20; woodpulp mills: 3; straw or other vegetable fiber mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	102,955	121,836
Chemical woodpulp	54,241	54,766
Mechanical or groundwood pulp (including wet lap)	49,273	56,969
Straw or other vegetable fiber pulp	2,640	2,969
Total Pulp Production	106,154	114,704

Principal paper grades manufactured: Newsprint, tissue, cigaret and fine

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard exports	38,137	31,841
Chemical woodpulp imports	55	14,853

Principal paper and paperboard exports to: Brazil, Argentina, Uruguay

Principal pulp imports from: Scandinavia, U.S.A.

—Santiago

CHILE IS WORKING CLOSELY with various U.S.A. companies to establish a pulp and paper operation here. Firms from abroad enter business in Chile on the same footing accorded to domestic Chilean concerns, Chilean officials have told this publication. They also say they consider their laws which concern business operations to be quite liberal and attractive to foreign capital.

A $10 billion ten-year development plan for Chile bids well for the future of the nation's pulp and paper industry. Chile began developing this national economic plan several years ago, and its completion coincides with the new U.S. administration's plans for greater inter-American cooperation. Money will come from within Chile through planned increased savings and from abroad in the form of invested capital.

Expansion Programs

Additional pulp and paper facilities will take advantage of Chile's extensive stands of Monterrey pine, which number more than 625,000 acres.

Newsprint and pulp are considered advantageous export fields. The development plan is expected to add some 180,000 tons of newsprint and 190,000 tons of pulp to the annual capacity by 1970. Newsprint output at the San Pedro mill of Cia Manufacturera de Papeles y Cartones is being increased 60,000 tons at cost of $1,000,000.

Industrial Forestales, S.A. will erect a 60,000 ton newsprint mill in the Bio-Bio province at an estimated cost of $17,000,000. The technical study was made by Sandwell International. Negotiations for foreign currency financing are well advanced, and loans will have the guaranty of Corporacion de Fomento, Chile's Development Authority.

Chile has secured the financial ($1.2 million) and technical aid of the UN Special Fund to set up an Institute For The Development of Forest Resources and Industries. Organizational plans are being prepared with the advice of the FAO. This autonomous agency will make surveys, train personnel, recommend conservation techniques, effect market studies and suggest improvements in forestry legislation.

Of Chile's total 1960 production of 110,760 metric tons of paper and paperboard, about 92,760 tons were produced by Cia. Manufacturera de Papeles y Cartones.

Brazil

Expansion, new plants spur rapid growth; more planned

Population: 65,743,000. Per capital paper and paperboard consumption: 21 lbs. (9.7 kg.) Paper and paperboard mills: 62; woodpulp mills: 30; straw or other vegetable fiber mills: 6

PRODUCTION (short tons)	1959	1960
Paper and paperboard	484,000	511,500
Chemical woodpulp	165,000	194,700
Mechanical pulp	68,000	99,000
Straw or other vegetable fiber pulp	22,000	49,500
Total Pulp Production	279,400	343,200

Principal paper grades manufactured: All kinds.

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	189,750	203,500
Paper and paperboard exports	111	
Pulp imports	117,700	98,120

Principal paper and paperboard imports from, Sweden, Norway, Finland

Principal pulp imports from: Finland, Norway, Sweden

By EUGENE F. HORN
Editor for Brazil

THE PULP AND PAPER industry has accompanied the extraordinary rapid economic growth of the country during 1960. The major pulp mills, Champion Celulose and Cicero Prodo, initiated production of 81,840 short tons daily during 1960. Many of the established companies increased their production of pulp and paper. A major factor in the rapid development of the pulp and paper industry in Brazil has been the investment of over $6 million of foreign capital in 13 pulp and/or paper companies during the past few years. Twenty new pulp and/or paper companies were formed in 1960 with a capital of $282,000.

Pulp production including groundwood increased from 279,400 short tons in 1959 to 342,980 short tons last year. There was a corresponding increase in pulp consumption from 397,534 short tons in 1959 to 441,144 short tons in 1960. It is probable that Brazil will attain self-sufficiency in chemical pulp production this year as the total pulp production will probably be 541,200 short tons for an estimated consumption of 484,000 short tons.

However, Brazil will need to import a certain quantity of groundwood for many years. Pulp production will probably attain 605,000 short tons during 1962 and in 1963 for an estimated consumption of 616,000 short tons. It is probable that Brazil will commence the exportation of chemical pulp in 1962 and in 1963 a Uruguayian firm, Lutcher S.A. Celulose e Papel, will commence exports to that country.

Sixty-two companies are actively engaged in the manufacture of paper and paperboard, of which 30 are located in São Paulo, and they turned out 511,500 tons of paper products last year as compared to 483,890 short tons in 1959 and 203,500 tons last year; therefore the consumption of paper and paperboard increased from 673,632 short tons in 1959 to 715,000 short tons in 1960.

Standard of Living Rises

The increase in the consumption of paper during the past five years was mainly due to the rapid industrial expansion which has resulted in a higher standard of living for the entire population. Nevertheless, the per capita consumption of paper in Brazil is still very low, being about 21 lbs. as compared to 400 lbs. in the United States and 97 lbs. in Europe. A major factor in the increased consumption has been the increasing demand for fiber containers and kraft bags. Bares do Brasil S.A., a subsidiary of the St. Regis Paper Co., consumed over 33,000 short tons of kraft paper in three plants manufacturing multiwall bags last year.

Devaluation Favors Exports

Brazilian importers of pulp and paper as well as machinery and equipment will have to pay 100% more for their dollars and other hard currencies due to the devaluation of the cru-

NEWEST MILL in Brazil's booming paper industry is Champion Celulose S.A. at Magi-Guacu, Sao Paulo. It and Cicero Prado, both of which started production in 1960, produce 81,840 tons of pulp, paper a year.

ANOTHER ADDITION to Brazil's industry is this converting operation at Belo Horizonte, Bates Valve Bag Corp. Last year 20 new pulp and paper companies of varying sizes were formed in Brazil; in past few years, more than $6 million has been invested from outside.

zeiro from 100 to 200 cruzeiros per dollar on March 14. This measure will drastically restrict imports. Conversely, it will enable Brazil's rapid expanding pulp and paper industry to meet foreign competition and perhaps increase the prices of pulp and paper products within the country. It also is expected to enable Brazil to export her excess of chemical pulp profitably.

There are now 43 plants in Brazil which manufacture machinery and equipment for the pulp and paper industry and their total capitalization is more than $1.5 million. Many of these companies are licensed by American, European, or Canadian manufacturers. The largest of these firms is the Cia. Federal de Fundição of Rio de Janeiro affiliated with The Black-Clawson Co. and Parsons & Whittemore of the U.S.A. This firm manufactures a complete line of machinery for pulp and paper mills and has exported machinery to the U.S.A., Peru, etc.

One of the pioneers in the manufacture of pulp and paper machinery is the Indústrias Mecanica Cavalri which commenced the manufacture of paper machinery in 1935, and to date has supplied 70 machines to the paper industry whose output accounts for 41% of the paper produced in Brazil.

Production Must Be Increased

In order to attain self-sufficiency in pulp and paper needs, Brazil will have to increase the production of groundwood pulp and newsprint. Even with the full development of the present and potential Paraná Pine resources it appears unlikely that this species could supply the future requirements for groundwood and newsprint.

Furthermore, the increasing demand for long-fiber kraft pulp will probably absorb most of the potential supply of pulpwood from this source. The time is not far distant when the Brazilian pulp and paper industry will be obliged to turn to the broadleaf tropical forests of the Amazon Basin for at least a part of its raw material requirements. These forests cover an area of approximately 1,300,000 square miles and contain many woods of the cottonwood, basswood, birch maple and gum density class suitable for the production of a groundwood type of pulp by the cold caustic soda process. These broadleaf Amazon woods have fiber lengths of from 0.8 to 2.2 mm. and fiber widths of from 15 to 40 microns. These values compare very favorably with the broadleaf woods of the temperate zone whose range in fiber length is from 0.7 to 1.6 mm. and fiber widths from 20 to 40 microns. The broadleaf forests of the lower Amazon Valley offer the most promising field for development of the pulp and paper industry in South America. The cheapness of timberlands, the abundance of timber of high quality, as well as the undeveloped hydro-electric power resources, combined with their geographical position (water transportation being available from the forests to the world's markets), will enable a pulp and paper mill in this region to meet competition from all quarters.

The superiority of Brazil over other countries as a potential producer of pulpwood is obvious when one considers that 80 years are necessary to produce a certain quantity of pulpwood in Canada and that the same quantity can be grown in southern United States in 25 to 30 years, while in the State of Sãn Paulo eucalyptus will produce the same quantity in 8 or 10 years and certain broadleaf species in the Amazon Valley require only 4 to 6 years to produce the same quantity of pulpwood.

BRAZIL—WOODPULP

(in metric tons)

	1959		*1960*	
	Production	*Imports*	*Production*	*Imports*
Chemical woodpulp				
Dissolving & special alpha	40,000	18,500	41,800	11,100
Sulfite paper grades				
Bleached	30,000	33,000	53,000	18,900
Unbleached	50,000	14,000	34,400	17,300
Total sulfite	80,000	47,000	87,400	46,200
Sulfite paper grades				
Bleached and semibleached	18,000	13,000	82,400	8,900
Unbleached	58,000	35,000	53,000	25,800
Total sulfite	76,000	48,000	135,400	34,700
Soda	23,000		24,700	
Total chemical	219,000	113,500	289,300	92,000
Semi-chemical woodpulp	44,000		51,700	
Mechanical woodpulp				
Groundwood	91,000		92,000	
Defiberated & exploded	20,000		20,000	
Total mechanical	111,000		112,000	
Total all grades	374,000	113,500	453,000	92,000

The above figures are based on airdry weight with 10% moisture content.

LATIN AMERICA

Argentina

Confidence in stability stirs industry investors

Population: 20,500,000. Per capita paper and paperboard consumption: 64.4 lbs. Paper and paperboard mills: 68; woodpulp mills: 3; straw or other vegetable fiber mills: 7

PRODUCTION (short tons)	1959	1960
Paper and paperboard	380,901	360,800
Chemical woodpulp	4,434	4,180
Mechanical pulp	18,194	18,194
Straw or other vegetable fiber pulp	74,973	74,973
Total Pulp Production	97,601	97,347
IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	153,797	146,080
Pulp imports	123,954	115,280
Newsprint imports	138,701	153,560

Principal paper and paperboard imports from: Finland, Sweden, Norway
Principal pulp imports from: Sweden, U.S.A.

By JULIO CÉSAR LERA
Editor for Argentina

—Buenos Aires

THE RECUPERATION PROCESS is well underway in Argentine business and industry. As has been reported previously in many PULP & PAPER articles, Argentina has passed from its state-directed economy to a realistic and entirely free economy, due to the execution of the "Big Plan" of Engineer Alvaro C. Alsogaray. While it is criticized in some quarters, Engineer Alsogary's plan has called for the liberation of the top prices and has given full play to the laws of supply and demand.

This fact resulted in a very great increase of the prices principally during 1959 but less so in 1960, and during the first four months of 1961 the rise in prices has been only 0.09%.

An important development is a loan of $9,190,000 from the Export-Import Bank to the Argentine enterprise Ledesma S.A.A.I., to cover purchase in the U.S.A. of machinery and equipment for a bagasse pulp and paper mill to be constructed near the large sugar plantation of Ledesma in the province of Jujuy in northern Argentina. The mill, already under construction, can be finished within three years. It will have an initial daily capacity of 100 tons and an eventual production of 300 tons per day.

It hasn't yet been exactly determined what sort of paper they will produce, but it is interesting to note that the firm Ledesma S.A.A.I. has already executed, so as to replace for fuel the bagasse utilized to make the pulp, the branch of a gas line.

Another interesting feature to note is a canal 28 Km. in length made of concrete. This canal carries the waters of the San Lorenzo river and in this way permits the necessary water provision assured for the making of pulp and paper. Ledesma S.A.A.I. has secured the services of the American well-known international pulp and paper expert, William A. Robinson.

This is the reality of the economic expansion process that is being operated in our Argentine Republic.

Much Interest in New Mills

Several other new projects have been either projected or undertaken in Argentina of late. Foreign companies figure prominently in investment in various pulp and paper plants.

One of the most recent announcements is that of a contract between Krupp Industries of Germany and the Argentine government for a cellulose mill in Misiones province in the extreme northern section of the country situated between Brazil and Paraguay. A Krupp team surveying the project includes technicians from Canada and Sweden.

Actual site selection and financing were not completed as of this writing. The Argentine government indicated it desires to have a small paper plant connected to the pulp mill. Integrated pulp-paper plants of this type are a feature of most of the other Krupp cellulose operations.

The Canadian engineer, Mr. Alkman, reported favorably on the project, while a forester, Mr. Merrit, also of Canada, said that the forestry aspect is quite impressive, from the standpoint of height and growth of the timber in Misiones. Mr. Alkman predicted the area could support additional mills in the future.

Kamyr Plant Is a First

A new cold soda Kamyr plant has been supplied to Cellulosa Argentina, S. A., by Elof Hansson of Göthenburg, Sweden. It is said to be the first plant of its type in Latin America. This Buenos Aires-based company is one of the largest producers in South America.

Near Bernal, not far from Buenos Aires, La Papelera Argentina, S. A., is building a new 50-tons-per-day bleached pulp mill, which will utilize hybrid willow and poplar. The Bauerite process will be employed. The United States Machinery Co. of New York is supplying equipment and engineering services. The Export-Import Bank of Washington, D. C. is making

ARGENTINA—PAPER AND BOARD
(in short tons)

	Imports	*Production*	*Total*
1949	240,836	195,565	436,401
1950	211,949	232,548	444,497
1952	178,509	220,006	398,515
1953	37,025	191,925	228,950
1954	70,770	251,511	322,281
1955	135,587	305,538	441,125
1956	123,321	289,332	412,653
1957	165,000	297,000	462,000
1958	170,500	361,000	531,500
1959	153,797	380,930	534,727
1960	146,080	360,800	506,880

ARGENTINA—WOODPULP
(in short tons)

	Imports	*Production*	*Total*
1949	76,519	38,191	114,710
1951	141,622	45,295	186,917
1952	94,979	41,628	136,607
1953	39,173	43,390	82,563
1954	186,797	58,230	245,028
1955	222,588	88,000	310,588
1956	143,695	88,000	231,695
1957	152,700	90,000	242,700
1958	176,000	102,000	278,000
1960	115,280	97,347	212,627

ARGENTINA—NEWSPRINT IMPORTS
(in short tons)

1949	112,012
1950	104,621
1951	117,082
1952	95,484
1953	30,776
1954	54,241
1955	92,030
1956	98,555
1957	132,898
1958	162,950
1959	138,600
1960	153,560

JULIO CESAR LERA, vice president of Francisco Lera S.A. Financiera y Comercial, Buenos Aires, is also this magazine's editor for Argentina. He represents newsprint producers of several countries in the Argentine market and has advised on mill plans.

$2 million available for the pulp mill and additional paper-making facilities. The pulp will go into board, newsprint and tissue.

A Swedish pulp group, Mo och Domsjö, is investing $300,000, mainly in the form of new machinery, in the Argentine company, Papelera Rio Paraná SA at Campana. Mo och Domsjö also will furnish technical assistance in the construction of the new bleached sulfite mill. This project, when completed, will give Papelera Rio Paraná a yearly capacity of 17,400 metric tons, an increase of 11,400 tons over the previous capacity. $3 million will be provided by the International Finance Corp. of Washington, D. C. In all, the cost amounts to $5.3 million.

The first coated paper machine in South America, a Beloit Iron Works Fourdrinier machine, with Improved Machinery stock equipment, is soon to be producing at Celulosa Argentina, S.A. Dr. Emil Gagliardi is the technical director.

This is a 160-inch wide machine. The coated paper will be used for printing and publication papers. The mill has six other paper machines and two board machines, making wrappings, bag paper, tissues and paperboard.

Cuba

Wood and bagasse use increased by Castro

Population: 6,900,000. Per capita paper consumption: 73 lbs.
Paper mills: 8; pulp mills: 2

PRODUCTION (short tons)	1959	1960
Paper production	160,000	150,000 (est.)
Pulp production	27,000	25,000
Paper imports	110,100	80,000 (est.)
Chemical pulp imports	80,000	———
Dissolving pulp imports	50,000	———

—Havana

PRODUCTION in Cuba's eight paper mills and its two integrated pulp and papermills has been interrupted in at least some mills during revolutionary developments.

Under Premier Castro's agrarian reform program, thousands of eucalyptus trees have been planted on lands which have been unproductive for years. These trees will mature and be ready for harvesting in 10 years. Reports also indicate that the Castro government is going in for chemical and paper production on an accelerated scale, particularly from bagasse. One mill, Tecnica Cubana, is producing paper from 100% bagasse. It is also reported that a sugar by-product pilot plant has been erected for experimentation.

Castro's soldiers, according to reports, have already planted more than half a million eucalyptus trees with plans to complete planting of some five million more this year. A central statistical board has also been set-up to provide production figures in the future.

Another plan calls for the first Cuban attempt at water conservation with 45 dikes planned. It is hoped that increased water retention and increased rainwater retention will result from construction of absorption ditches and retainer walls.

Uruguay

Two woodpulp mills are now under construction

Population: 2,950,000 (est.). Per capita paper and paperboard consumption: 42 lbs. (19 kg.)
Paper and paperboard mills: 6; woodpulp mills: 2; straw or vegetable fiber mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	41,000	37,230
Mechanical pulp	1,300	1,300
Straw or other vegetable fiber pulp	7,200	7,500
Total Pulp Production	8,500	8,800

Principal paper grades manufactured: Kraft and sulfite, book and writing, tissue, paperboard, coated papers

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	35,000	26,417
Pulp imports	22,090	30,565

Principal paper and paperboard imports from: Sweden, Canada, Finland
Principal paper and paperboard exports to: Argentina
Principal pulp imports from: Finland, Sweden, U.S.A.

—Montivedeo

ONLY SOME 554,000 hectares, or 3.3% of Uruguay's 16,206,000 total land area are forested. These limited forest resources until now have dimmed the prospects for a vigorous pulp and paper industry. Yet, there are two new woodpulp mills under construction, which when completed will bring the total number of pulp mills to five. One of the new mills will be the first in the country making chemical woodpulp. It already makes straw fiber chemically.

Newsprint continues to be the largest import item, but there was a substantial decrease last year when newsprint imports dropped to about 19,956 metric tons. There were small lots of toilet tissue exported, the only paper exports.

Chemical pulp imports from Canada were 1,741 metric tons; from the U.S.A., 6,131 tons and from Scandinavia, 17,749 tons. Total pulp imports of all kinds totaled 27,787 metric tons (30,565 short tons).

Peru

Wallboard mill being built

Population: 10,524,000 (est.). Per capita paper consumption: 14 lbs.
Paper mills: 6; Under construction: 1

PRODUCTION (short tons) (est.)	1959	1960
Paper production	21,000 (e)	55,000
Pulp production	55,000 (e)	21,000
Newsprint imports		16,000
Pulp imports		10,000

Principal imports from: Canada, Sweden, Finland, Norway, U.S.

—Lima

A NEW WALLBOARD MILL being built by Primadera Peruana on the San Jacinto sugar estate in northern Peru will use bagasse for raw material. The controlling firm is owned by U.S., British and Peruvian interests.

Completion last year of the 20-year-old W. R. Grace mill at a cost of $1.5 million boosted production over the 55,000 mark. Grace will install its fifth machine at the Paramonga mill to produce bleached papers.

Principal imports include bleached sulfite pulp, used mainly for the manufacture of rayon, and unbleached sulfite, which is mixed with bagasse at the Grace mill.

Colombia

Paper consumption on the rise

Population: 13,824,000 (1959 est.). Per capita paper consumption: 11 lbs.
Production (based on 1959 figures in short tons):
Paper production: 46,000
Mechanical pulp imports: 650
Chemical pulp imports: 24,500

—Bogotá

A RISING STANDARD of living in this South American nation can be partially attributed to increasing industrial growth, particularly near Cali. There, a bagasse paper mill will use a minimum of 78,000 short tons of pulp

annually to help meet climbing per capita demand. Initial production is estimated at 28,000 tons. The mill, Papeles Grace Colombianos, SA, will furnish a broad line of papers including printing and writing stocks, lightweight wrapping, grocery bag kraft and sanitary tissues.

The quick pulping Peadco process at Cali is the same one that is used by Grace at Paramonga, Peru, where the world's first bagasse mill was built 23 years ago. The new mill will cost $1.6 million and could result in a predicted saving of $8 million in yearly imports.

Scott de Colombia, a company formed last year by Scott Paper Co., U.S.A., and two Colombian industrialists, John Gomez Restrepi and Sr. Mario Uribe, also is expected to add to the country's over-all production.

By 1965, Colombia is expected to have a capacity of 100,000 tons yearly.

Puerto Rico

Boosts paper consumption more than 10 lbs./person

Population: 2,353,000. Per capita paper and paperboard consumption: 97.7 lbs. (44.3 kg)
Paper and paperboard mills: 2

PRODUCTION (short tons)	1959	1960
Paper and paperboard	26,510	39,612
Total Pulp Production	24,080	31,843

Principal paper grades manufactured: Paperboard

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	73,197.5	75,334.5
Paper and paperboard exports	6,001	17,331
Pulp imports	1,223	1,041

Principal paper and paperboard imports from: U.S.A., Canada, Finland, Norway
Principal pulp imports from: U.S.A., Canada

By WILLIAM FREYTES MARTINEZ,
Chief
Research Services Division
Office of Economic Research

—San Juan

THE GLEAMING NEW MILL started up last year by W. R. Grace was acquired this year by International Paper Co. In addition, other mills have expanded during 1960. The result has been a rise in per capita paper consumption from 86.4 lbs. to 97.7 lbs. per person.

The International mill, which went into bagasse paper production last year in Arecibo, boasts a cylinder machine and a combination Fourdrinier and cylinder machine. Pulp is produced from 75% bagasse and 25% waste. The mill is managed by E. R. Bouchard who is well known in the U.S. paper industry. During 1960 the mill produced 18,000 tons of paper products and over 9,000 tons of pulp for their own use.

The other pulp mill is in Guaynabo, Caribbean Paper Board Corporation, which produced during 1960 over 13,000 tons of pulp and over 11,000 tons of paper during this same period. This paper mill has a Downingtown board machine.

San Juan has become an extremely active converting center. In addition to Caribbean Paper Stock Corporation, Impresores Inc. manufactures folding boxes; Pan American Paper Bag Corp. makes kraft paper bags; José Rodríguez Ema Inc. makes set up and folding boxes; Caribe Carton Corp. makes carton containers; Envelopes Inc. makes envelopes; Kimberly-Clark International S. A. makes facial and toilet tissues and other sanitary products; Thom-Tex Paper Converting Corp. makes school composition books, and Laboratories Sein Inc. manufactures boxes for pharmaceutical products.

Consolidated sales of eight EDA promoted and/or assisted firms manufacturing paper and paper products in Puerto Rico amounted to $5,687,167 during 1959.

As of February 1961 employment and payroll statistics for eleven firms belonging to the paper and paper products industry showed 598 production workers with a weekly payroll of $31,075.

Panama

Pulp industry is a potential

Population: 1,067,766. Per capita paper and paperboard consumption: 21 lbs.

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	9,834	10,966
Pulp imports	1,929	2,191

Principal paper and paperboard imports from: U.S.A.
Principal pulp imports from: U.S.A.

By JAIME JÁCOME
Vice Minister of Agriculture, Commerce & Industry

—Panama

THE LONG-RANGE PICTURE in this Central American Republic includes a pulp mill 100 tons per day capacity, utilizing native hardwoods. A number of serious studies point up the problems as well as the opportunities involved in constructing such a mill.

According to information supplied to the ministry of agriculture, commerce and industries, it would be entirely feasible to establish a pulp and paper industry in this area, where the tropical and subtropical forests represent one of the world's greatest stores of forest wealth. The immensity of the potential future market in Latin America will act as a great stimulus to the development of domestic production.

Based on the results of an ecological survey in 1955, the prospects of a new industry appear best in the Bocas del Toro Province. Raw materials available would provide supplies for 24 years for a 100 tons per day mill. Interim growth, reforestation and other prospective sources of raw material (such as palm fronds), would permit a 50-year-cycle operation.

The Forest Product Laboratory of Madison, Wisconsin, U.S.A., has made paper from timber samples from Bocas del Toro and found it to be comparable in quality to paper made from conventional pulps.

Venezuela

Paper activity high as 25% increase is planned

Population: 6,500,000. Per capita paper and paperboard consumption: 44 lbs. (20 kg)
Paper and paperboard mills: 5; straw or other vegetable fiber mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	16,250	44,000

Principal paper grades manufactured: Kraft; tissue; paperboard

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	25,380	66,000
Pulp imports	14,125	35,200

Principal paper and paperboard imports from: U.S.A., Canada, Sweden
Principal pulp imports from: U.S.A., Canada, Sweden

By ADÁN CELIS G.
Venepal General Manager
(C. A. Venezolana de Pulpa y Papel)

—Caracas

PRESENT PAPER AND PAPERBOARD consumption in Venezuela is about 120,000 tons including 40,000 tons of newsprint that are imported. C. A. Venezolana de Pulpa y Papel "VENEPAL," the largest producer, made about 30,000 tons of kraft paper and paperboard last year and is expected to produce 40,000 tons for 1961. In addition to VENEPAL there are three other mills in production at the present time, Papeles Venezolanos at Guacara, tissue, paper napkins; Cartón de Venezuela at Caracas, bogus medium, jute liner, chipboard; and Fábrica de Papel de Maracay, Maracay, wrapping papers, tissue.

Three more mills are being constructed in Venezuela: Manufacturas de Papel is constructing a two-machine mill at Maracay to make multiwall bag and M.G. papers; Papelera Continen-

tal is presently starting up a Yankee machine ordered from Finshyttous AB, Sweden, at Valencia, M.G. papers to be produced; also at Valencia, Cartones de Venezuela, is starting construction on a cylinder mill to make boxboard.

At present time the only pulp mill in the country is that of VENEPAL at Morón with a capacity of 75 tons per day. Bagasse from the nearby sugar mills will be used as raw material. The pulp mill was engineered by the Process Evaluation Technical Services Corp., a subsidiary of W. R. Grace & Co. The bagasse pulp will be mixed in the furnish with virgin kraft pulp and waste papers to make liner board, corrugating medium and bag papers.

Four years of operation on a temporary basis has resulted in the establishment of the Latin American Forestry Institute for Research and Training at the University of Los Andes, Merida, Venezuela.

A multilateral agreement has been reached between the UN's Food and Agriculture Organization (under whose auspices the Institute will operate) and the governments of Venezuela and other interested nations. Aims of the group: To carry out research projects, particularly those of broad interest and of an applied nature that would contribute to conservation, utilization and development of forest resources; organize training courses in line with future demands for both government and private foresters; gather, classify and disseminate forestry information and promote regional coordination of research.

Surinam

Pulp-paper potential studied

Population: 313,600. Per capita paper and paperboard consumption: 17.6 lbs. (8 kg.)
Mills: None
Paper and paperboard imports: 2,563 tons
Principal paper and paperboard imports from: The Netherlands, U.S.A.

—Paramaribo

ALTHOUGH SURINAM has no pulp and paper industry yet, two companies are investigating the nation's potential. Problems of forestry development are being studied by C. D. Schultz & Co. of Vancouver, Can. Stadler-Hurter, International, Ltd., Montreal and Zurich, is looking into engineering phases. As a first step, conifers were planted on a trial basis to discern suitability of their raw material in pulp and paper production.

Honduras

Mill proposed in Olancho

Population: 1,987,623. Per capital paper and paperboard consumption: 4.6 lbs.

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	6,166	6,328
Imports of finished pulp-paper products	—	3,165

Principal paper and paperboard imports from: U.S.A., Canada, Norway, Sweden, W. Germany

—Tegucigalpa

THIS CENTRAL AMERICAN country, one of the larger and possibly the richest in natural resources, has been wooing the pulp and paper industry for several years now, and it appears likely its efforts may be successful.

For sometime, negotiations have been carried on between the government of Honduras and National Bulk Carriers of New York for a contract which calls for Carriers to survey the prospects for a large paper mill to utilize the native hardwods.

Would Serve Central America

The new mill would have a capacity capable of supplying much of Central American paper and paperboard needs. The mill would be erected in the northern part of the Department of Olancho. Wood as a raw material is plentiful; Honduras has a total forest area of approximately 12 million acres.

Another company which has long been interested in pulp and paper possibilities is Standard Fruit & Steamship Co., which has extensive lands here.

The United States Department of Commerce reported earlier this year that Honduran Ministry of Finance officials reviewed the revised investment proposal of National Bulk Carriers and were hopeful that the government's counterproposal would be accepted by the Carriers and International Paper Co., its associate in the venture.

USDC reported further: "The latest proposal calls for an investment of $22 million, the government and American investors to participate equally in the capital structure and the profit sharing. Management and administration of the enterprise will be controlled by the private investment group. The government is to finance the construction of roads and other ancillary facilities in the Olancho area, and the newly formed corporation is to finance other facilities. The government counterproposal was under study by the American investment group, and credit facilities in the United States, public and private, were being explored."

Box, Bag Factory Planned

Also planned is the establishment of a paper box and bag factory in La Ceiba, to be known as Manufacturas de Carton, S.A. A capital of $500,000 and an investment of $1,500,000 are expected.

Ecuador

Capital, know-how needed for industry development

Population: 4,320,000. Per capita paper and paperboard consumption: 7.5 lbs.
Paper and paperboard mills: 4; woodpulp mills: 1; straw or other vegetable fiber mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	4,000	4,510
Chemical woodpulp	—	1,210
Total Pulp Production	3,600	1,210

Principal paper grades manufactured: All kinds; kraft; paperboard
IMPORTS-EXPORTS
Principal paper and paperboard imports from: Canada, Sweden, U.S.A., Chile

By DR. M. ACOSTA-SOLIS
Director of Ecuadorian Institute of Natural Sciences, Quito

—Quito

PAPER CONSUMPTION was slightly greater in 1960 than in the previous year. Next year, or possibly by the end of 1961, it is expected that a new paperboard mill will be built. The new mill is planned by W. R. Grace & Co. It will produce 1,500 tons of cardboard per year and will be the largest mill in Ecuador.

The largest mill at the present is the Industria Papelera Ecuatoriana, C. A. IPECA is the only integrated pulp and paper mill in the country. It is located at Latacunga. There are five other paperboard mills, three located in Guayaquil and two in Quito. In all, some 5,200 tons of paper and paperboard are produced here.

Timber Is Untapped

The raw materials most used in Ecuador are the banana and abaca fibers and grasses such as "paja de páramo" (*Stipa* and *Festuca* spcs.). But for the larger industry of paper of this tropical country, Ecuador has an enormous forest potential, more than 50% of the total area, consisting of chiefly the coast or west region and at the Oriente or east region. The best area for forest industry in Ecuador is the northwest, chiefly in Esmeraldas Province and the Santiago River basin. In this area there are all the

kinds of tropical woods, hard, medium and soft, and furthermore, good stands of bamboo.

We believe that the great virgin forest of Ecuador will be utilized when the capitalists and businessman know the properties of the different kinds of tropical woods, as in Brazil, Colombia and Venezuela. Ecuador needs only capital and technicians for the development of the paper industry and the other forest industry.

Guatemala

Big expansion under way at only pulp-paper mill

Population: 4,000,000. Per capita paper and paperboard consumption: 8 lbs. (3.6 kg)
Paper and paperboard mills: 1; vegetable fiber mill: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	2,200	2,800
Straw or other vegetable fiber pulp	1,540	1,400
Total Pulp Production	1,540	1,400

Principal paper grades manufactured: All kinds; kraft; sulfite; book and writing; paperboard

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	13,200	16,000
Paper and paperboard exports	1,210	1,500
Pulp imports	440	700

Principal paper and paperboard imports from: U.S.A., Finland, Sweden
Principal paper and paperboard exports to: El Salvador, Honduras
Principal pulp imports from: U.S.A.

—Guatemala City

PLANS FOR THE EXPANSION of Central America's only pulp and paper mill are being completed, according to Minor Keilhauer, president of Industria Papelera Centro Americana, S.A., in Esquintla, Guatemala. Mr. Keilhauer, head of several Guatemalan industries, made history in Central America some years ago by using lemon grass waste as raw material for paper fiber. It is still a part of the furnish being used here.

The mill plans to rebuild its 120 inch Fourdrinier machine, lengthen the wet end, and add stock preparation equipment to double its papermaking capacity and make possible the manufacture of heavier grades.

The company was formed in 1959 as a joint venture between Mr. Keilhauer, owner of the then existing board mill (the one which started out on lemon grass fiber, still used to some extent), Jaime and Enrique Arimany, of Guatemala City, and Central National Corp., a division of the Gottesman-Central National Organization of New York City. The new company enlarged the mill site and built an adjacent building to the board mill to house the Fourdrinier machine. The foundation work and construction of the building was designed to accommodate a third machine which will be added as the requirement for paper products grow.

Immediate annual capacity: 9,000 tons of kraft papers, bonds, tissues, linerboard, and 6,000 tons corrugating medium, tag, board, index, assorted boards. Esquintla is 40 miles west of Guatemala City.

Bolivia

Paper consumption has slight increase but is still low

Population: 3,462,000. Per capita paper and paperboard consumption: 5.56 lbs. (2.53 kg.)
Paper and paperboard mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	283.7	435.44
Straw or other vegetable fiber pulp	283.7	435.44
Total Pulp Production	283.7	435.44

Principal paper grades manufactured: Paperboard

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	3,740	3,740

Principal paper and paperboard imports from: Chile, Germany, Sweden, U.S.A.

By JONNY VON BERGEN
President, La Papelera S.A.

—La Paz

THERE IS NO PAPER INDUSTRY in Bolivia as such. The only paperboard mill in existence has an annual production of only 800 tons. Some years ago I made extensive studies to build a chemical pulp and paper mill in our country using the huge hardwood forests. But I abandoned the project because of the very small consumption.

The paperboard mill uses grass which is found in great quantities on the high plains in our country or in an altitude of about 3,000 to 4,000 meters. The fiber of this grass is excellent and could be used for the production of paper but unfortunately the cost of harvesting is high.

The paperboard mill was built under my direction. During the war the mill went into possession of Fabrica y Manufactura de Cartones y Taleres Litograficos, but after the war, this plant again came into our possession.

Dominican Republic

No action on bagasse mill

Population: 4,070,108. Per capita consumption of paper: 6 lbs.
Paperboard mills: 2; straw and other vegetable fiber mills, 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	310	679

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard	12,994	12,887

Principal paper imports from: U.S.A., Finland, Sweden, Canada

—Cuidad Trujillo

POLITICAL UNREST following the assassination of this island's dictator General Rafael Trujillo temporarily made this country's pulp and paper prospects uncertain. Nothing new has developed on the three-year-old discussions to establish an 8,500-ton year bagasse pulp mill for fine papers.

The island has one paperboard mill which produces about 100 tons a year. More than 50,000 metric tons of sugar cane bagasse are estimated to be available for converting into paper or paperboard.

A new bag plant, Industrias Nigua, started production of 90,000 bags per day for sugar, cement and fertilizers. Workers were trained by German and U.S. bag machine experts.

Haiti

Politics delay development

Population: 3,500,000. Per capita paper consumption: 3 lbs.
Mills: None
Paper and paperboard imports (short tons): 2,100
Principal paper and paperboard imports from: Canada, U.S.A.

—Port au Prince

AS THE POLITICAL SITUATION continues somewhat turbulent, there has been hesitancy in the development of plans for the utilization of sugar cane bagasse for a paper industry.

It is believed this may become a reality some day. There are favorable concessions offered to industries that will come here.

Possibilities for paper and board converting enterprises are also a subject of governmental and industrial consideration.

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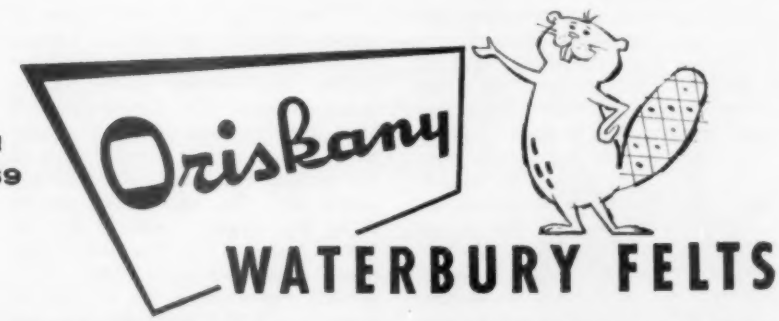

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El Salvador

Studies prospects for industry

Population: 2,520,000 (1959 est.). Per capita paper consumption: 7.6 lbs.
Production (based on 1959 figures in short tons)
Paperboard: 206
Paper and paperboard imports: 9,486
Principal paperboard imports from: Canada, U.S.A., Sweden

—San Salvador

ALTHOUGH El Salvador is the smallest of the five Central American republics, it is one of the most progressive. A sweeping $33 million improvement of the country's electrical power and highway system could be the step needed to stimulate construction of more bagasse pulping mills.

At present one small mill, Cia Casanellas J., produces about a ton of board a day on its 36-in. cylinder machine. The sugar cane industry in El Salvador produces about 50,000 metric tons of dry bagasse each year. These factors could be the basis of a cellulose and paper bag industry, and are the subject of a study by Instituto Salvadorena de Fomento del la Produccion (INSAFOP).

West Indies Fed.

Bagasse production is attractive to pulp, paper industry

Population: 4,100,000. Per capita paper consumption: 10 lbs.

—Trinidad

While there are no pulp and paper mills in the West Indies Federation, more than 200,000 tons of sugar cane bagasse is produced a year from which paper and paperboard products could be economically made.

The territorial needs are attractive, too, for establishment of a pulp and paper industry. Last year paper and paperboard imports jumped to $4,533,820 from the 1959 level of $3,682,048. Value of paper and board articles imported – $3,901,549 – was $402,000 more than in 1959.

The territory now has a paper converting plant and there is an abundance of hardwoods on the islands although authorities would like to see the bagasse product utilized.

Owens-Illinois kraft mill at Jacksonville, Fla., has been harvesting pulpwood from the Bahamas for the past three years.

Brit. Guiana-Honduras

High paper consumption

BRITISH GUIANA
Population: 480,000. Per capita paper consumption, 27 lbs.
Mills: None

BRITISH HONDURAS
Population: 73,800. Per capita paper consumption: 35 lbs.
Mills: None

—Georgetown

EXPERIMENTS on the wallaba tree, prolific in the Guianas, may some day result in its use for making kraft pulp. It is a good pulp raw material for many grades, but not for high strength if used alone.

Hercules Powder Co (Canada) has built a new plant 75 miles from Belize, capital of British Honduras, to process pine logs and stumps to make naval stores. About 200 are employed for harvesting the pine and 75 will work in the plant.

Nicaragua

One million acres set aside for a pine forest

Population: 1,450,000. Per capita paper consumption: 8 lbs.
Paper mills: None
Paper imports: 6,000 short tons

—Managua

A LARGE INCREASE is foreseen in exports from this largest of the Central American countries. Dr. Bruce W. Taylor of the FAO has just completed a five year assignment here making an ecological survey. As a result of his recommendations based on his land surveys carried out over approximately half this country of 57,145 sq. miles, a decision was made to set aside one million acres for a pine forest in the northeast of this country.

"This project could lead to the establishment of a large pulp and paper industry in the area which would become a valuable part of the Nicaraguan economy," Dr. Taylor said. Although the project was only started in 1959, more than 80,000 acres of the projected one million are already under pine. The reforestation project is on the savanna lands of the Atlantic coast in the Puerto-Cabezas-Rio Coco region. Reforestation is by natural regeneration. An average of more than 4,000 seedlings grow per hectare.

Costa Rica

Imports meet country's needs

Population: 1,199,116. Per capita paper consumption: 14.5 lbs.

—San Jose

ALTHOUGH NOT A MAJOR importer, this southernmost Central American republic imported some $1,946,786 in paper products last year. Bulk of the imports was newsprint, printing papers, and wrapping papers.

Imports totaled 9,722 tons of all grades of paper. Of this total 3,985 tons comprised newsprint, valued at $610,107; 1,389 tons, book and other printing papers, valued at $395,950; 2,907 tons, wrapping and packaging papers valued at $619,993 and 1,104 tons, carton grades valued at $151,256.

Paraguay

Consumption limits expansion

Population: 1,718,000. Per capita paper consumption: 4.2 lbs.
Production (based on 1959 figures in short tons): 450 tons roofing board
Imports: 3,150 tons

—Asunción

PAPELERA PARAGUAYA is the only mill in production now. It produces 450 tons of roofing board a year, which with imports, totals only 3,600 tons of paper and board consumed per year. Although the country abounds in forest resources and water, development of a larger industry is impractical, because demand is low.

French Guiana

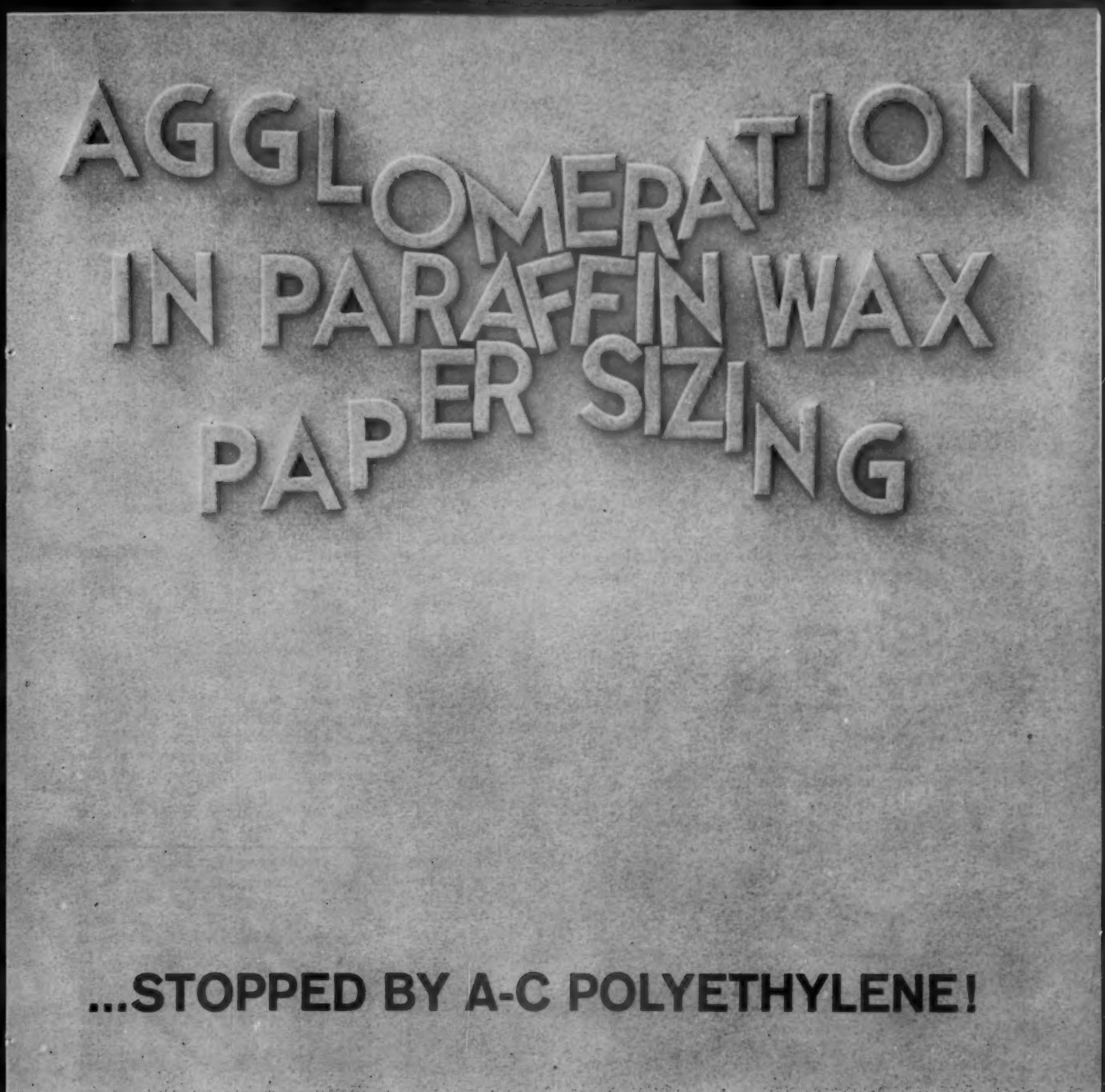
Immense forests available

Population: 30,000. Per capita paper consumption: 5 lbs.
Mills: None

—Cayenne

EXTENSIVE FORESTS here may be used some time for pulp and paper but so far the principal use is for lumber. This territory lies north of Brazil and east of Surinam (Dutch) and includes Devil's Island, famed penal settlement.

The wallaba forests are considered a possibility for utilization in production of some paper grades. Preliminary studies made on this species have been favorable.



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New Zealand

Output will double in 10 years at present rate

Population: 2,377,000. Per capita paper and paperboard consumption: 177 lbs.
Paper and paperboard mills: 5; woodpulp mills: 3

PRODUCTION (short tons)	1959	1960
Paper and paperboard	180,500	203,010
Chemical woodpulp	162,100	170,250
Mechanical pulp	115,000	122,530
Total Pulp Production	277,100	292,780

Principal paper grades manufactured: Newsprint, kraft, tissue, paperboard

IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	61,239	69,881
Paper and paperboard exports	53,649	61,988
Pulp imports	9,844	13,503
Pulp exports	86,045	78,483

Principal paper and paperboard imports from: U.K., Canada
Principal paper and paperboard exports to: Australia
Principal pulp imports from: Finland, Sweden
Principal pulp exports to: Australia, U.K.

By A. R. ENTRICAN & G. YSKA
Editors for New Zealand

—Wellington, North Island PULP AND PAPER is one of the most rapidly developing industries in New Zealand, and there is every indication that the present high rate of expansion will continue for at least the next decade. Because of the young age of the exotic forests in this country, the high capital cost of establishing pulp-paper plants and the need for relatively large installations, the development of the industry has been mostly of recent origin.

The existing plants have all embarked on expansion programs and it is estimated that these plants alone will require some extra 15 million cubic feet of pulpwood annually. The planned increases in production will almost double present output.

Board Plant Planned

Though no detailed plans are available for expansion beyond 1965, it is expected that a pulp and paper mill and a fiberboard mill will be established in the South Island, and also that further expansion of present plants will continue. This should almost treble present production by 1970.

Progress on the building of the second newsprint machine for Tasman Pulp and Paper Ltd. is satisfactory. This Walmsley machine will have a designed speed of more than 2,500 feet a minute and will bring the company's newsprint capacity to 225,000 tons in 1963. The bulk of this output will go to Australia.

The Tasman Pulp and Paper Co., which draws all its raw wood from the state-owned Kaingaroa forest, has now embarked on its own afforestation program to provide a further adequate reserve against present wood requirements, and future expansion. It also hopes to draw raw material from farm forests.

Merger Aids NZFP

New Zealand Forest Products Ltd., the second big pulp and paper manufacturer in New Zealand, has become one of the biggest industrial enterprises in the country, after taking over control of Whakatane Board Mills in December 1960. The merger will prevent the possibility of wasteful duplication of plant and should result in economies in production and distribution.

Progress on the pulp mill expansion to increase chemical pulp production by 34,000 tons is up to schedule and is expected to begin production by June 1961. The No. 3 paper machine should be operating in 1962 with a capacity of 17,000 tons of kraft papers. The No. 2 fiberboard machine starts production in June 1961, bringing fiberboard production to a total of 130 million square feet per year.

Three important developments took place early in 1961 as part of N.Z. Forest Products' $16½-million expansion program. The first was the completion of the company's wood-fiber wallboard mill at Penrose, Auckland; the second was the extension of the company's Kinleith pulpmill; and the third—ordering of a third paper machine for Kinleith. Production of the

THE AUTHORS ARE STAFF members of the New Zealand Forest Service in Wellington. Mr. Entrican is former director-general and Mr. Yska is statistics officer. A veteran of many years in the forest products and forestry field, Mr. Entrican also serves as editor of this publication for New Zealand.

ALEX R. ENTRICAN—for several years has contributed to this World Review, and we hope, will continue as New Zealand editor. He has just retired as director-general of Forests, New Zealand. Headed its Forest Service for 22 years.

NEW ZEALAND—PAPER PRODUCTION
(in short tons)

Year	Newsprint	Other Paper	Paper Board	Fiber Board
1939	—	7,003	7,414	—
1944	—	7,095	15,998	7,685
1949	—	7,964	16,437	15,149
1954	—	25,193	19,912	21,647
1955	10,080*	31,532	22,652	23,901
1956	59,024	34,538	27,700	23,985
1957	72,478	42,558	31,676	25,520
1958	84,334	49,128	36,382	25,794
1959	85,232	55,068	40,787	27,810
1960	100,016	59,132	43,863	28,162

*First newsprint made in 1955.

NEW ZEALAND—WOOD PULP
(in short tons)

Year	Production: Mechanical Pulp	Production: Chemical Pulp	Total Imports	Total Exports	Consumption
1939	243	—	6,966	—	6,760
1944	17,286	—	13,991	—	25,421
1949	23,606	—	5,742	—	33,345
1954	33,116	48,388*	5,984	21,933	62,029
1955	42,553	68,762	6,117	30,622	83,838
1956	85,005	129,274	4,073	53,038	142,316
1957	101,697	132,872	7,655	72,793	167,543
1958	115,933	147,359	9,572	77,238	196,261
1959	115,041	156,864	9,844	86,045	206,071
1960	122,527	170,250	13,503	78,483	224,252

*First chemical pulp made in 1953.

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company's kraft pulpmill at Kinleith has been increased from 70,000 to 100,000 long tons annually by addition to the chipper house and the installation of a new set of quintuple effect evaporators and the two new washers as well as of three batch digesters and auxiliary equipment. N.Z. Forest Products Limited now has nine batch type digesters and one Kamyr continuous digester. Diversification and full flexibility of pulp production will also be achieved.

A second wallboard mill has been erected at Auckland to meet increased consumer demand. The capacity of the new plant is in the vicinity of 80 million square feet annually. The new plant will raise output from the two mills from 90 million sq. ft. annually to over 130 million sq. ft.

The company has ordered a new Fourdrinier paper machine which will produce fine writing and printing papers. The trimmed width of reels will be 120 inches, and estimated output will be from 15,000 to 20,000 tons annually. The machine is being made by Walmsleys (Bury) Limited, England, to specifications laid down by N.Z. Forest Products Ltd., and will incorporate the latest developments in paper making machines. It is expected that the machine will be shipped soon.

The new $800,000 chlorine plant installed by N.Z. Forest Products Ltd. at Kinleith is now successfully operating. It uses the latest design Krebs Mercury cells.

Progress at Tasman

Reports from Kawerau, on the Bay of Plenty, were that the installation of the second newsprint machine of Tasman Pulp & Paper Co. Ltd., is well along. This project has been named by the company, Project Koke, the latter being a Maori native word meaning "progress." Engineering for this is being done by the Bowater engineering and development company in Tennessee, U.S.A., where Bowater has one of its largest mills.

Designed by Beloit of Wisconsin, USA, and built by Walmsleys, England, the new machine will run at 3,000 feet per minute, making it one of the fastest newsprint machines in the world. Additional equipment includes three new grinders for the groundwood mill, giving a capacity for groundwood pulp production of over 500 tons per day.

This company, which has an issued share capital of £7,000,000, commenced production in 1955. The output from its single newsprint machine in 1960 was 84,000 tons. Production of woodpulp was 49,500 tons and timber 55,000,000 board feet.

—Rotorua, North Island

So far as the future is concerned in New Zealand, the trend of pulp products is for an overall unit demand that clearly will keep on rising for many years, according to M. B. Grainger, forest economist at the Forest Research Institute.

Writing in the N. Z. Timber Journal, Mr. Grainger said, "We now need to know where we are heading for the future. The Government statistician has forecast a population approaching five million by the year 2000, and further increases must be expected thereafter. What is planted within the next decade or two will largely determine our ability to meet the demands of the period 2000-2025. Without discussing population trends in detail it can be stated that forest planning must anticipate future populations of at least the following order: 6.5 million by 2025, eight million by 2050, and 10 million by 2100.

Moreover, since these are conservative figures based on much lower rates of increase than have occurred over the last 20 years, they are put forward as minimum rather than maximum levels of population."

Paper Consumption Now Low

Mr. Grainger predicts that the increase in per capita demand will be mainly in the field of paperboard and other paper. He said that newsprint consumption is now so high that it is not likely to rise more than another 10 lbs. per capita, while paper and paperboard unit consumption is at present very low.

"Increasing industrial development in conjunction with higher density populations will undoubtedly lead to a marked increase in the need for paper and paperboard. For instance, a high density population accompanied by a swing to multi-storey flats will mean a considerably lower proportion of home gardens and consequently a much bigger demand for canned and frozen fruit and vegetables—all of which require cartons for bulk handling and transport. And as the range of locally manufactured goods widens so will the demand for packaging materials increase," he stated.

Packaging Picture To Change

"After studying overseas trends the conclusion is that our consumption of paper and paperboard will increase rapidly to reach at least 150 lbs. per capita by the end of this century. Beyond that point, however, there are insufficient grounds for budgeting for any further increase in unit demand for pulp products, as we must anticipate the entry of some further new materials into the packaging field. Accordingly at this stage it would be logical to assume that new materials will at least offset any further increase in unit demand that may take place beyond the turn of the century.

"Expected demand trends show that pulp products requirements will jump from an estimated 316,000 tons taking 42 million c.ft. of timber in 1975 to 1,161,000 tons requiring 157 million ft. in 2100. Of this figure paper and paperboard account for 670,000 tons, while newsprint takes 312,000 tons. Fiberboard consumption is listed at 112,000 tons and that for particle board at 67,000 tons.

"These figures cover the gross N.Z. demand before any allowance is made for imports and use of waste wood and waste paper," reported Mr. Grainger.

Australia

Long term outlook is bright despite temporary setback

Population 10,380,000. Per capita paper and paperboard consumption: 176 lbs.
Paper and paperboard mills: 18; woodpulp mills: 4; vegetable fiber mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	513,000	555,520
Chemical woodpulp	146,000	161,280
Mechanical woodpulp	67,600	75,040
Vegetable fiber pulp	4,000	4,480
Total pulp	217,600	240,800
IMPORTS-EXPORTS (short tons)	1959	1960
Paper and paperboard imports	336,000	346,080
Pulp imports	144,500	168,000
Paper and paperboard exports	12,300	5,600

Principal paper grades made: Newsprint, kraft, book and writing, tissue, paperboard
Principal paper and paperboard exports to: New Zealand
Principal pulp imports from: New Zealand, Scandinavia, Canada
Principal paper and paperboard imports from: Canada, U.K., New Zealand

By DR. WILBY E. COHEN
Editor for Australia

—South Melbourne

UNTIL ABOUT THE LAST QUARTER of 1960, a continuing increase in demand in the Australian pulp, paper and paperboard industry seemed to assure that big expansion plans would continually be put forward. In the meantime, the Australian government has felt obliged to take various measures, popularly known as the "credit squeeze," to steady the nation's financial situation.

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overseas and internally, it hopes to arrest the present recession and to forestall an otherwise possible depression. Although those in authority regard the situation as a passing phase, the measures taken have catalyzed a chain reaction which has culminated in curtailment of home buiding; a decreased demand for automobiles and other luxuries which are widely purchased under "hire purchase" agreements, and for various consumer goods; curtailment of manufacturing programs and retrenchment of industry personnel.

Because of these effects and in the face of increasing competition from imports, the pulp, paper and paperboard industry has had to revise its production programs to conform with decreased sales and, in some cases, to lay off personnel, although, it is confidently hoped, only temporarily. It is not anticipated that expansion and developmental plans will have to be revised except possibly in setting back start-up dates. As an indication of the investor's confidence in the future, new development plans currently are being negotiated.

Hardwood-Softwood Economy

With the continuing growth of pine plantations in Australia, more and more interest is being kindled in these as pulpwood resources. Hence, the predicted transformation from a total hardwood economy to hardwood-softwood is steadily taking place. It is anticipated that this trend will continue.

Even now, much of Australia's softwood pulp imports come from neighboring New Zealand where the development of *Pinus* spp. plantations has been more intensive and their utilization more advanced. With an eye to the future, the Australian pulp and paper industry, through its forestry subsidiaries, and the forest services, has intensive pine-planting programs underway. Much effort is being de-

Six Largest Companies In Australian Industry

Six largest pulp and paper companies in Australia, in order are:

Australian Paper Manufacturers Ltd.*
Associated Pulp & Paper Mills Ltd.
Australian Newsprint Mills Ltd.
Shoalhaven Paper Mills Ltd.
Cellulose Australia Ltd.*
Bowater Scott Australia Pty. Ltd.

* These two companies have equal interest in Apcel Ltd. (tissue), which therefore is not listed.

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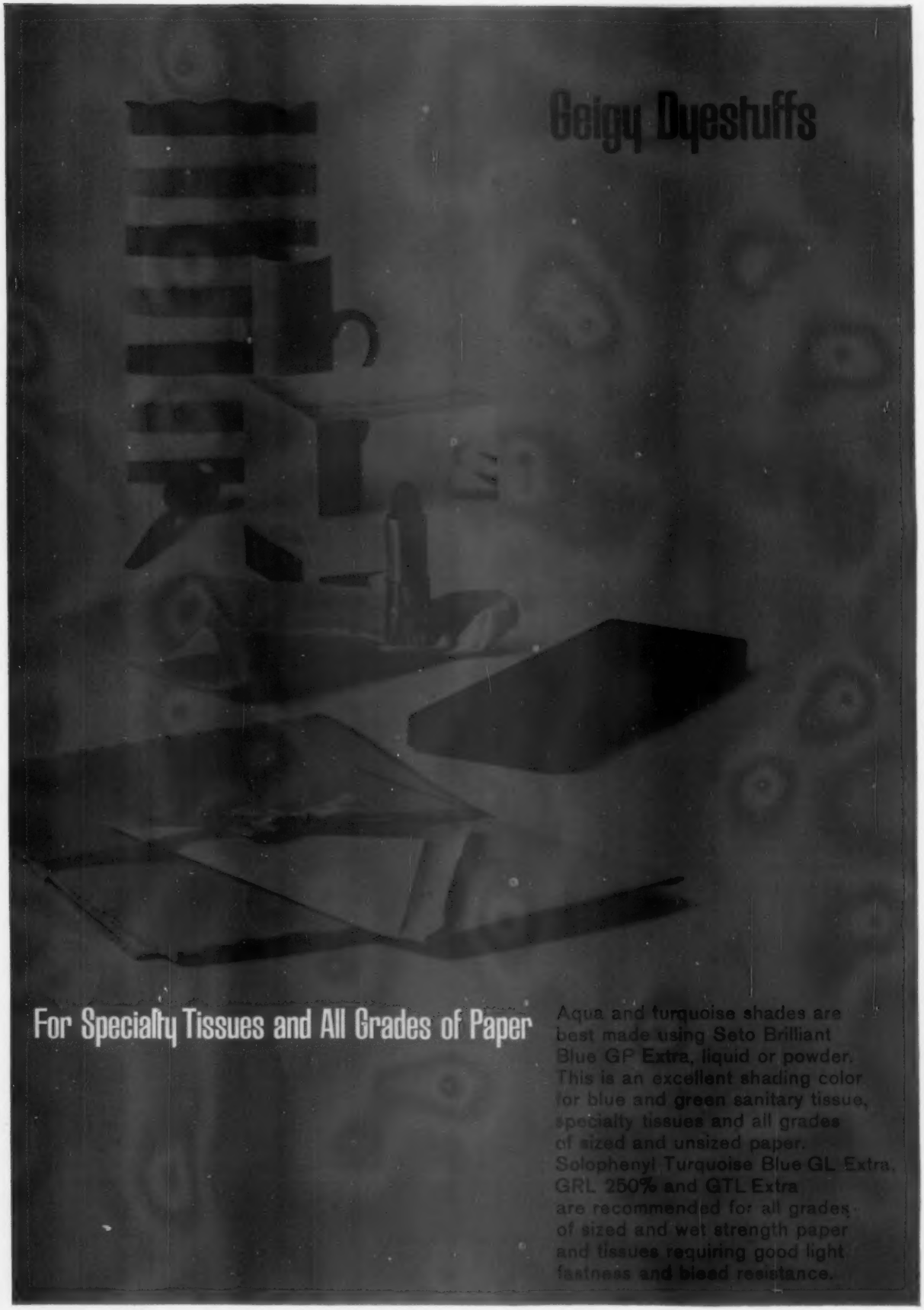
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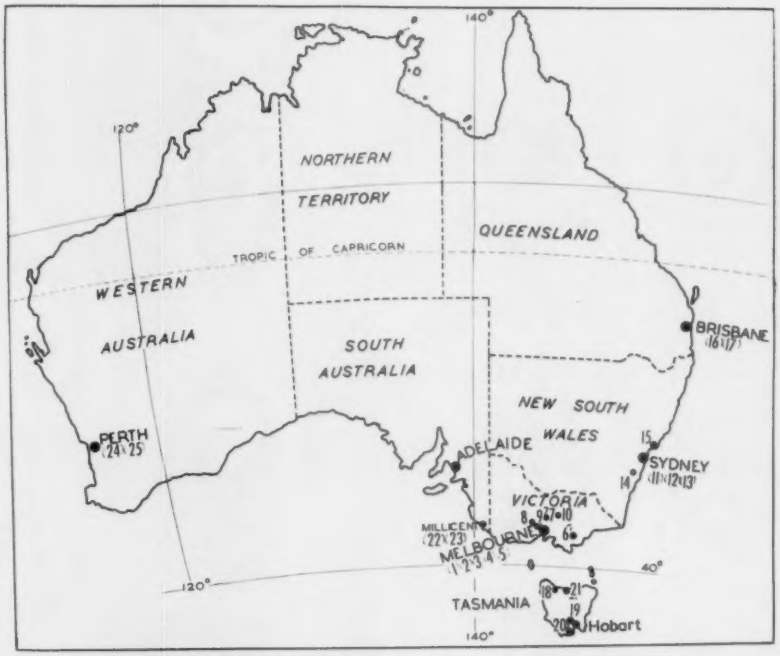
OCEANIA

voted to selection of elite trees for parents of pines whose wood will have properties most desirable for pulping and for lumber. In a general program of plantation development, one forestry subsidiary planted its 20 millionth tree during July, 1960. In addition to intensive pines activity, the industry is active in fostering growth of preferred eucalypt species, largely by encouraging natural regeneration.

Various expansion projects have been either completed or substantially advanced during the past year. In October, 1960, Australian Paper Mfrs. Ltd. brought into production its new kraft paper mill at Botany, New South Wales. Largest and fastest of its type in Australasia, the machine is capable of turning out a 17 ft. sheet at 1,500 ft/min. Its initial capacity is 40,000 long tons per annum but it has been designed for expansion to 100,000 tons. Products are corrugating paper, kraft liner boards, brown wrapping and bag papers.

Near Millicent in the southeast of South Australia, the pulp and tissue mill of Apcel Ltd., a joint enterprise of APM Ltd. and Cellulose Australia Ltd., started up in July, 1960, and has since been in full production. Nearby, at Snuggery, Cellulose Australia Ltd. has begun installation of a second paperboard machine, the start-up of which is scheduled for mid-1963. Both these South Australian plants draw their pulpwood from extensive *Pinus radiata* plantations nearby.

DR. WILBY E. COHEN is senior principal research officer for the Commonwealth Scientific and Industrial Research Organization of the Division of Forest Products in Australia. He has been the editor in Australia for this magazine since early 1959.



PULP AND PAPER MILLS OF AUSTRALIA: 1—Australian Paper Mfrs. Ltd., Melbourne; 2—APM, Fairfield; 3—Bowater-Scott Australia, Box Hill (projected); 4—Ernest Nelson Pty., Footscray; 5—General Paper Industries (not yet settled); 6—APM, Maryvale; 7—APM, Broadford; 8—Ballarat Paper Mills, Ballarat; 9—Colonial Sugar Refining Co. (projected hardboard mill), Bacchus Marsh; 10—N.S.W. Masonite, Eildon; 11—APM Botany, Sydney; 12—Papyrus Pty., Syndey; 13—C.S.R. Insulating & Hardboard, Sydney; 14—Shoalhaven Paper Mills, Bomaderry; 15—Masonite, Raymond Terrace; 16—APM Petrie, Brisbane; 17—Burnie Board & Timber, Ipswich; 18—Papermakers Ltd., Burnie; 19—Australian Newsprint Mills, Boyer; 20—APM Port Huon, Huon Valley (projected); 21—Associated Pulp & Paper Mills, Wesley Vale (projected); 22—Cellulose Australia, Millicent; 23—Apcel Ltd., Millicent; 24—APM Bayswater, Perth; 25—APM, Perth.

In Victoria, APM Ltd. completed extensions to and started-up its No. 1 machine at Maryvale. In the Melbourne area, at Box Hill, Bowater-Scott Australia Pty. Ltd. started up its fully integrated tissue and converting mill early in 1961. It has a 12,000 ton/yr. capacity. Although not exactly within the scope of these notes, the start-up and official opening of C.S.R.'s Timbrock plant at Bacchus Marsh was in May, 1961. With several eucalypt hardwoods as raw material this Swedish-designed but mostly Australian-manufactured plant is designed to produce 70 million sq. ft. of hardboard per annum.

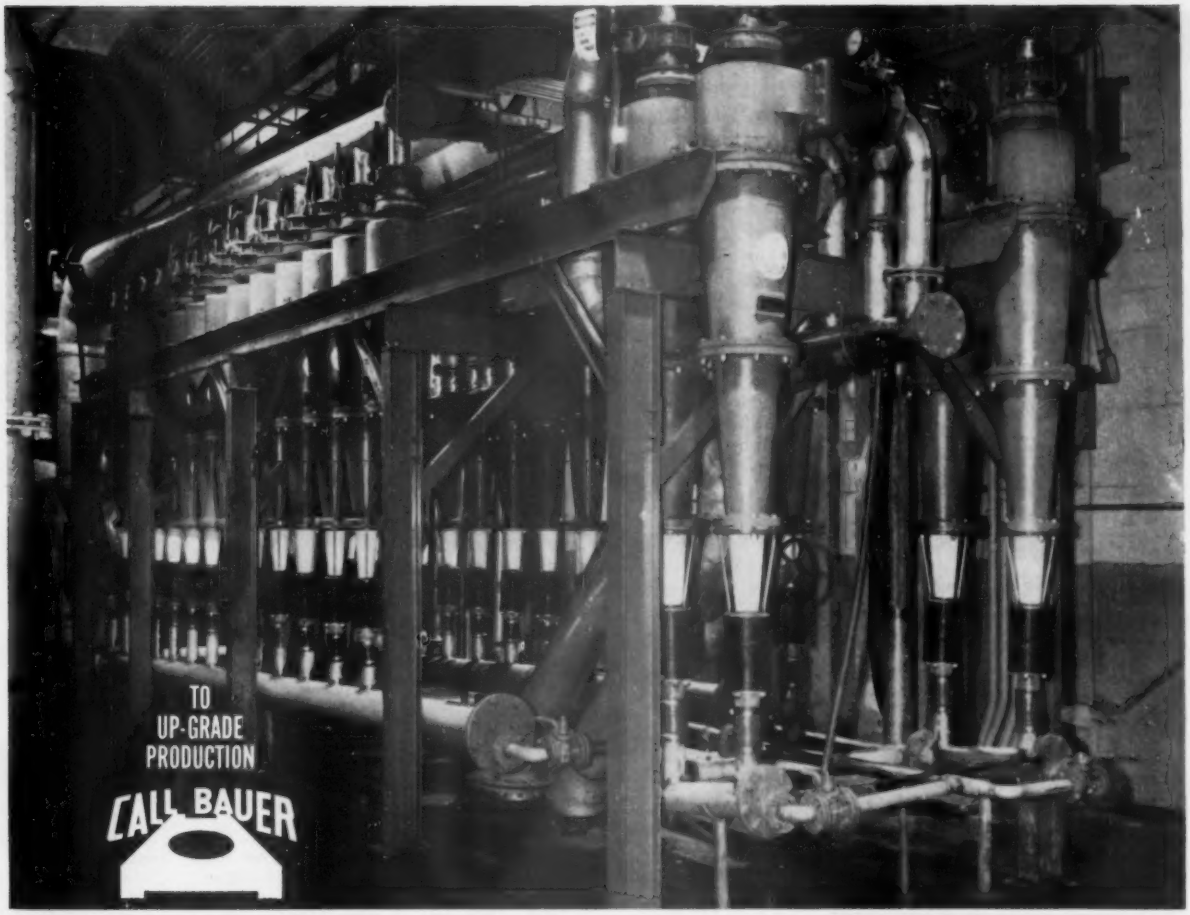
At Petrie, Queensland, APM has accelerated extensions to its board machine. Doubling drying capacity was completed by July, 1960. When the new "Inverform" wet end comes into service in mid-1961, the capacity of this machine will reach 50,000 long tons per annum.

Other Expansion Activities

To these various expansion projects, completed or well advanced, should be added those which aid the various mills in producing better products at faster rates, *e.g.* water supply installations, chlorine-soda plants, etc.

New projects, which are either in preliminary stages or have been announced, demonstrate the considerable expansion which is to take place within the next decade or so. Of special interest is that some will use pines as their raw material. Associated Pulp and Paper Mills Ltd. is currently engaged in a large-scale expansion program which might take 20 years to mature. The most immediate development is a new paper machine which is expected to come into production at Burnie late in 1962. They plan eventually to build another mill at Wesley Vale, near Devonport, Tasmania, and this mill will use a considerable amount of pine wood. Planned first is a particle board plant, which later will be integrated with a pulp and paper mill. The whole development will amount virtually to duplication of the existing Burnie mill.

Australian Paper Mfrs. Ltd. is pushing ahead with construction of its NSSC pulp mill at Port Huron, Tasmania. This will be their first venture



Battery of Bauer No. 623 Centri-Cleaners on No. 4 machine at St. Croix Paper Company. Note long lasting ceramic lower cone nozzles and vacuum rejects-separator system which reduces wear on cleaners in the second and third stages of this modern installation.

Bauer Centri-Cleaners Improve Quality, Reduce Downtime at St. Croix

St. Croix Paper Company, Woodland, Maine, produces 500 tons of newsprint per day from pulp cleaned 100% with Bauer Centri-Cleaners.

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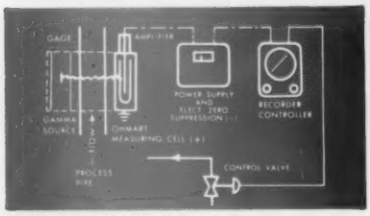

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in that state. The anticipated annual output is 25,000 long tons of pulp in pellet form for shipment to the mainland. Start-up is scheduled for December, 1962. This company is also planning to erect a new paper and board mill in Western Australia, at Spearwood, not far from Perth. It will have an initial capacity of 15,000 long tons/year and will be amenable to expansion. Start-up is scheduled for late 1966.

Shoalhaven Paper Mills Pty. Ltd. has planned a £7 million expansion program over a 3-year period. Initial cost of this development at Nowra, New South Wales, is estimated at £4 million. Plans are well advanced for the installation of their No. 3 machine. Overall effects of the proposed expansion will be to increase the mill's range of writing and printing papers, papers used in the high-grade packaging and laminating papers, and specialized papers which are now imported.

AUSTRALIA—GENERAL

	No. of Mills	No. of Employes	Value of Materials (In Thousands of Dollars)	Value of Output
1951	14	6,336	$23,300	$ 37,800
1952	14	6,750	24,000	42,000
1953	16	7,237	35,000	70,000
1954	18	7,179	34,000	73,000
1955	20	7,611	39,000	86,000
1956	17	7,480	42,000	87,000
1957	17	7,614	n.a.	n.a.
1958	17	7,903	n.a.	n.a.
1959	18	8,088	51,500	112,400
1960	20	8,775	72,800	162,400

AUSTRALIA—WOODPULP

(in thousands of short tons)

	Chemical		Mechanical	
	Prod.	Imports	Prod.	Import
1949	63	44	38	3
1950	68	37	38	1
1951	75	46	40	2
1952	77	53	47	6
1953	70	28	40	1.5
1954	90	48	64	5
1955	110	70	66	4
1956	136	69	71	4
1957	146	112	73	4
1958	157	105	74	4
1959	146	144	68	4
1960	161	164	75	4

Source: Australian government, U. S. Pulp Producers Assn., Canadian P & P Assn.

AUSTRALIA—PAPER

(in short tons)

	Production		
	Newsprint	Board	Total All Paper & Board
1946-47	31,734	76,563	185,870
1947-48	31,335	83,213	192,320
1948-49	30,260	85,307	193,460
1949-50	30,472	99,519	205,196
1950-51	33,000	103,000	220,000
1951-52	33,000	110,000	235,000
1952-53	70,000	112,000	270,000
1953-54	70,000	120,000	330,000
1954-55	77,000	170,000	366,000
1955-56	88,480	116,768	396,557
1956-57	89,200	179,200	444,192
1957-58	90,720	188,160	469,280
1958-59	93,000	213,000	513,000
1959-60	99,131	n.a.	555,520

Note: Australia's fiscal year July 1-June 30.

Philippines

Expects to add 8 more mills in 3 years to 11 in operation

Population: 24,500,000. Per capita paper consumption: 9 lbs.
Paper and board mills: 10; bagasse pulp mills: 1

PRODUCTION (short tons)	1959	1960
Paper and paperboard	35,695	43,400
Bagasse pulp	7,200	7,200
IMPORTS (short tons)	1959	1960
Woodpulp	11,983	11,500
Paper imports	147,352	160,000

Principal grades made: Kraft, book paper, writing, board, tissue
Principal paper imports from: U.S.A., Canada, Japan
Principal pulp imports from: U.S.A., Sweden, Canada

—Manila

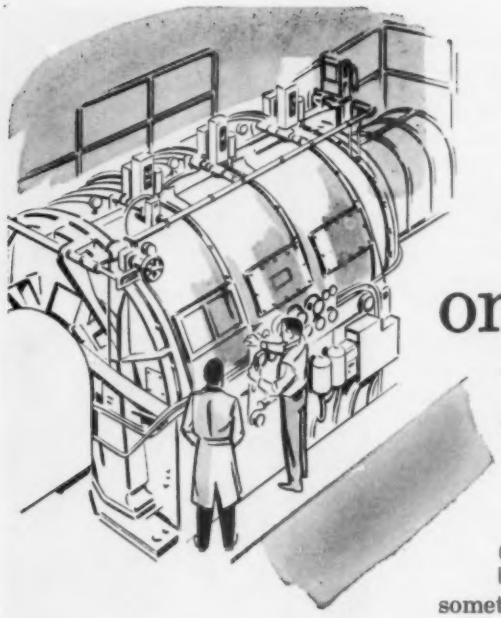
THE PULP AND PAPER industry is coming of age in this part of the world. Progress has been so rapid that the Philippine Industrial Development Center has made its third survey of the industry since 1957.

Results of this last survey show that

AUSTRALIA—Production, Imports, Exports, Consumption

(In short tons)

Year	Product	Production	Imports	Exports	Apparent consumption	Per capita consumption (lb)
1958-59	Pulp	232,000	140,000	224	372,000	
	Newsprint	93,000	216,000	–	309,000	62
	Other papers	199,000	79,500	5,600	273,500	55
	Paperboard	225,000	11,200	–	236,000	47
					Total	164
1959-60	Pulp	241,000	168,000	–	409,000	–
	Newsprint	99,500	243,000	–	342,500	67
	Other papers	227,000	89,600	5,600	311,500	61
	Paperboard	228,000	13,400	–	242,000	48
					Total	176



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seven pulp and paper mills were in operation in 1958. This increased to nine in 1959 and now there are 11. Total capacity of the nine operating mills was 8,000 metric tons of bagasse pulp, 53,684 tons of paper and 21,120 tons of paperboard. These mills employed 1,295 production and 263 non-production workers.

The nine plants produced about 6,059 tons of bagasse pulp, 11,861 tons of bond and writing papers, 293 tons of onionskin papers, 2,006 tons of mimeograph paper, 2,537 tons of tissues, 115 tons of newsprint, 98 tons of book paper, 232 tons of ledger paper, 14,920 tons of kraft paper, 374 tons of wrapping paper and manila paper, 3,437 tons of chipboard and 11,465 tons of boxboard, newsboard, and novelty boards, in 1959.

Bagasse pulp production was 76% of capacity; paper production, 64%; paperboard production, 71%. Pulp accounted for 17% of chemical and mechanical pulps consumed, 19% of the estimated pulp requirements for making the various papers that the mills produced and less than 7% of estimated (chemical and mechanical) pulp requirements to produce papers and bristol board consumed.

In June of 1960, a new pulp and paper mill, Arco Pulp and Paper Co., Inc., went into operation and later, Pacific Pulp and Paper Corp. went on line. Since then Arco has been producing book paper, bond and offset printing grades.

Two mills expanded their operations. Eastern Paper Mills Co., Ltd. put in a new machine at Marikina, Rizal, to produce linerboard, multiwall kraft paper, corrugating medium, mimeograph paper and newsprint. Philippine Paper Mills plan to expand their operation later this year.

The Bataan Pulp & Paper Mills, Inc. plant is going up very rapidly and is expected to start operations soon. This mill, being built by the Adamson brothers, will have a capacity of 75 tpd of bleached kraft pulp and 50 tpd of printing and writing paper. It will use about 6 tpd of purchased pulp. Alexander Adamson is president of the new company and also of Philippine Paper Mills Inc., one of the oldest established companies.

Scott Paper Co. has announced plans to invest $750,000 in a new Philippine paper corporation through its wholly-owned subsidiary, Scott Overseas Corp.

ONE-HALF OF THE PHILIPPINES ARE FORESTS. Eugenio de la Cruz (left), director of the Philippines Forest Products Research Institute, is describing a balete tree to George M. Hunt (right) of the United Nations Forestry Divison. They are in a national park in the province of Laguna.

THE PHILIPPINES—NEW MILLS
Pulp and Paper Mills to be Established, Products and Rated Capacities

Name of Pulp and/or Paper Mill	*Product*	*Rated Capacity Metric tons/ day*
1. Bataan Pulp and Paper Mills, Inc.	Pulp, bleached kraft	75
	Printing and writing paper	50
2. Aclem Paper Mills	Light paper products	6
3. C. G. Nazario & Sons	Pulp (bagasse, rice straw, cogon, and abaca waste)	20
	Paper	15
	Woodpulp	5
4. Calvento & Co.	Cigaret paper	5
5. Asiatic Steel Mfg. Corp.	Pulp (from abaca waste)	7
	Writing and printing paper	7
6. Bago Pulp and Paper Mills	Pulp (bagasse and abaca waste)	60
	Paper, bleached grades	30
	Paper, unbleached, and paperboard	40
7. Mindanao Pulp and Paper Mills, Inc.	Woodpulp	50
8. San Miguel-Bislig Paper Mills	Woodpulp	205
	Writing paper	42
	Newsprint	60
	Kraft paper	103

Soriano Development is Big

Potentially one of the most important pulp and paper developments in the Far East may be an expansion of the Don Andreas Soriano lumber operations at Bislig Bay.

Production of kraft paper would be made from waste from Biswick Bay Lumber Co. lumber and veneer operations. Later on, newsprint might be produced. Both plants would be at Bislig Bay. The company has already done much basic research.

The Soriano interests have started several long-fiber pine plantations at Bislig Bay. Benguet, Indonesian and Mindoro pines all are promising species. The company maintains a research section on forestry and has been practicing natural reforestation.

The kraft mill plant would be of 200 tons capacity per day. Soriano has been working with advice and assistance of International Paper Co., U.S.A.

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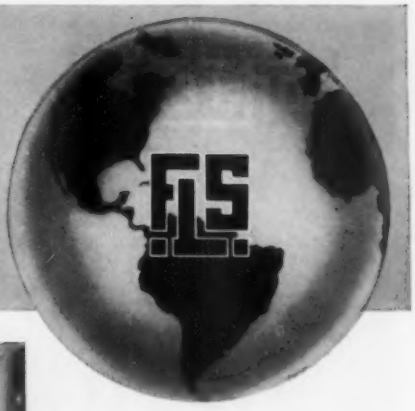

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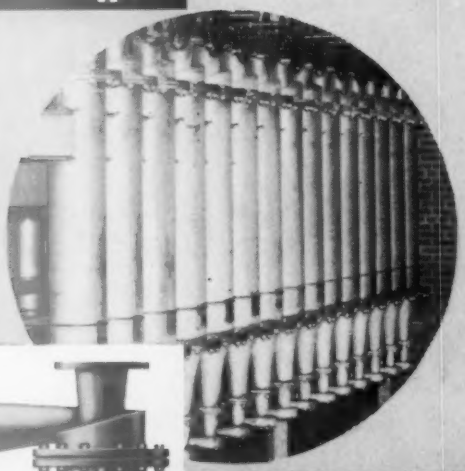

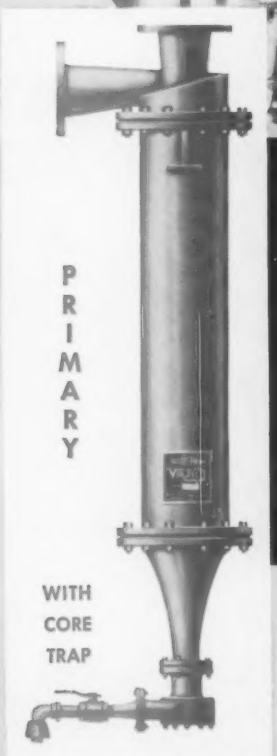

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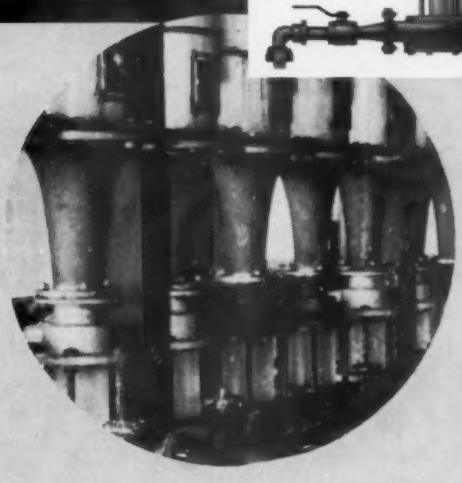

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PULP & PAPER's 1961-62 Directory of

Industry Organizations and Their Leaders

Associations and Institutions in the United States and Canada

American Paper and Pulp Assn.

H. E. Whitaker (photo), President. He is Chairman of the Board, Mead Corp., Dayton, Ohio.

Assn. headquarters at 122 E. 42nd St., New York 17, N.Y. Exec. Secy-Treas., **R. E. O'Connor.**

American Pulpwood Assn.

D. E. Hess (photo), President. He is Vice President and General Manager of The Glatfelter Pulp Wood Co., Gettysburg, Pa.

Assn. headquarters at 220 E. 42nd St., New York 17, N.Y. Exec. Secy.-Treas., **W. S. Bromley.**

Writing Paper Mfrs. Assn.

D. S. Leslie (photo), President. He is President of the Hammermill Paper Company, Erie, Pa.

Assn. headquarters at 122 E. 42nd St., New York 17, N.Y. Secy.-Treas., **Dernell Every.**

National Paperboard Assn.

Sture G. Olsson (photo), President. He is President of The Chesapeake Corp., of Virginia, West Point, Va.

Assn. headquarters at 80 E. Jackson Blvd., Chicago 4, Ill. Exec. Mgr., **Albert W. Luhrs.**

Kraft Paper Assn. Inc.

R. A. Nash (photo), President. He is Vice-Pres. of the Sorg Paper Co., Middletown, Ohio.

Assn. headquarters at 122 E. 42nd St., New York 17, N.Y. Secy.-Treas., **Dernell Every.**

Newsprint Service Bureau, Inc.

R. W. Wortham Jr. (photo), President. He is President and Chairman of the Board of Southland Paper Mills, Inc. Lufkin, Texas.

Assn. headquarters at 342 Madison Ave., New York 17, N.Y. Treas., **J. J. Zima.**

Tech. Assn. of Pulp & Paper Industry

Harold Annis (photo), President. He is Vice-Pres. of Oxford Paper Co., New York, N.Y.

Assn. headquarters at 360 Lexington Ave., New York 17, N.Y. Exec. Secy., **P. E. Nethercut.**

Assn. of Pulp Consumers Inc.

Bartow Kelly (photo), President. He is Vice-Pres. of Crocker, Burbank & Co., Ass'cn., Fitchburg, Mass.

Assn. headquarters at 250 Park Ave., New York 17, N.Y. Exec. Secy.-Treas., **Reed R. Porter.**

Sulphite Paper Mfrs. Assn., Inc.

Aaron P. Mitchell (photo), Gen. Chairman. He is senior Vice President, Director of Marketing, Riegel Paper Corp., New York N.Y.

Assn. headquarters at 122 E. 42nd St., New York 17, N.Y. Secy.-Treas., **Charles H. Leach.**

Paper Industry Management Assn.

C. Ives Gehring (photo), President. He is Mgr. Pulp and Paper Div., Sealright-Oswego Falls Corp., Fulton, New York.

Assn. headquarters at 10 N. Clark St., Chicago 2, Ill. Secy. and Treas., **Harry E. Weston.**

U.S. Pulp Producers Assn. Inc.

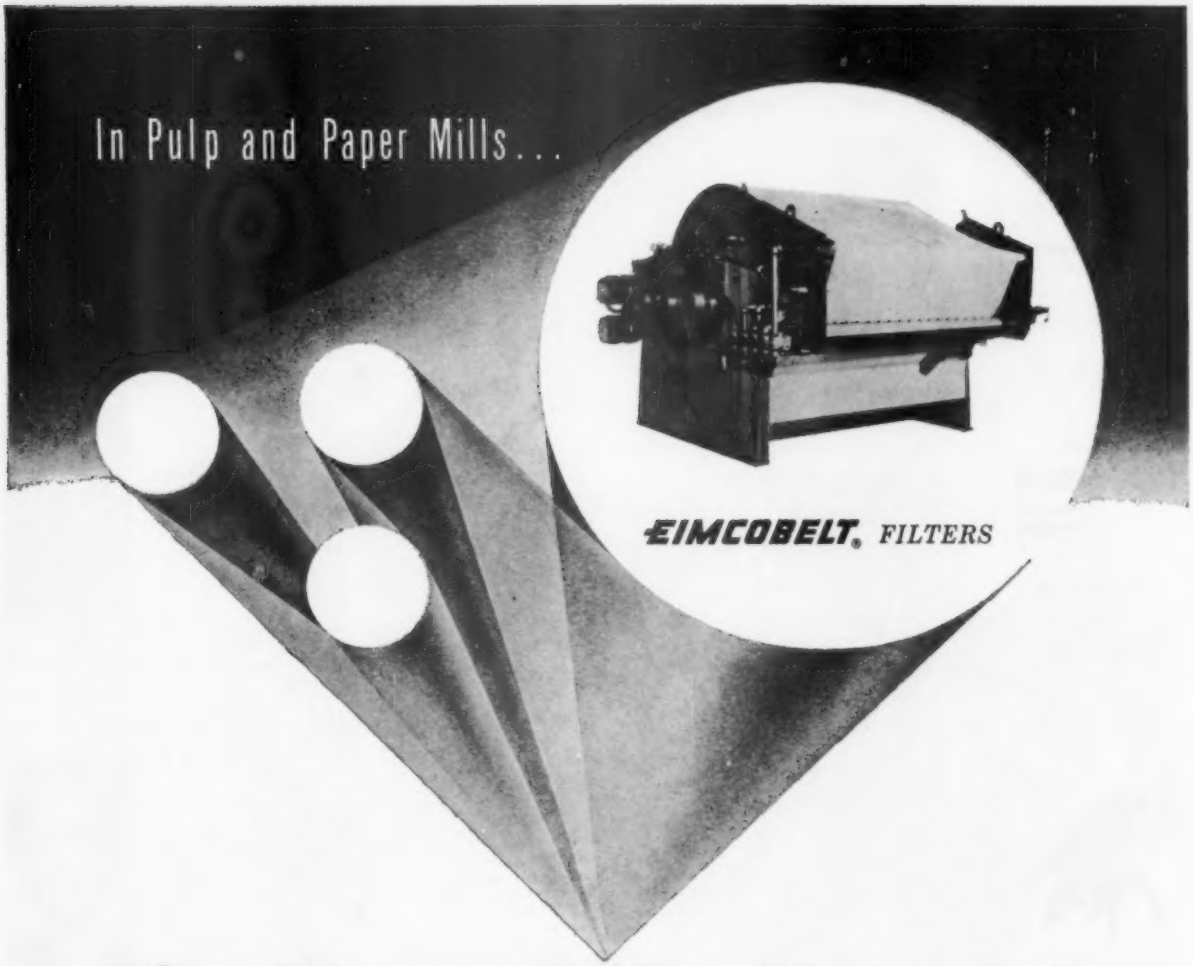
James L. Ritchie (photo), Executive Director.

Assn. headquarters at 122 E. 42nd St., New York 17, N.Y.

Salesmen's Assn. of the Paper Industry

Jack K. Barry (photo), President. He is Western Sales Manager, Fraser Paper Ltd., Chicago, Ill.

Assn. headquarters at 122 E. 42nd St., New York 17, N.Y. Exec. Secy. & Treas., **Anne G. Toomey.**



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D. A. Forsberg (photo), President. He is President of Forsberg Paper Box Co., Madison, Wis.

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Fibre Box Assn.

Jerome H. Stone (photo), President. He is Exec. Vice President of Stone Container Corp., Chicago, Ill.

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Eugene H. Clapp (photo), President. He is President of Penobscot Chemical Fibre Co., Boston, Mass.

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William F. Obear (photo), President. He is President of Tobey Fine Papers, Inc., St. Louis, Mo.

Assn. headquarters at 220 E. 42nd St., New York 17, N.Y. Exec. Secy., **O. Glenn Leach.**

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Robert W. Bertram (photo), President. He is Administrative Assistant, Stock Product Sales Dept., Marathon, Div. of American Can Co., Menasha, Wis.

Assn. headquarters at 122 E. 42nd St., New York 17, N.Y. Exec. Secy., **Arlo Wilson.**

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Southern Pulpwood Conservation Assn.

J. E. McCaffrey (photo), President. He is Vice-President of International Paper Co., Mobile, Ala.

Assn. headquarters at 900 Peachtree St., N.E., Atlanta 9, Ga. Gen Mgr., Henry J. Malsberger.

Southern Pine Assn.

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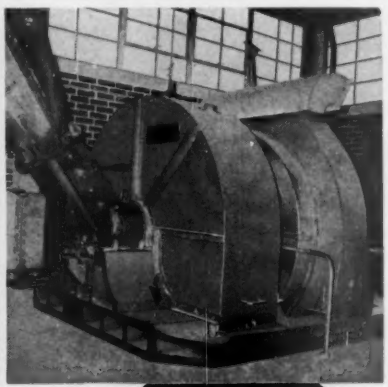
Assn. headquarters at P.O. Box 1170, New Orleans 4, La. Exec. Vice Pres., S. P. Deas.



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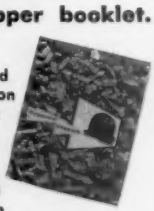

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Western Forestry & Conservation Assn.

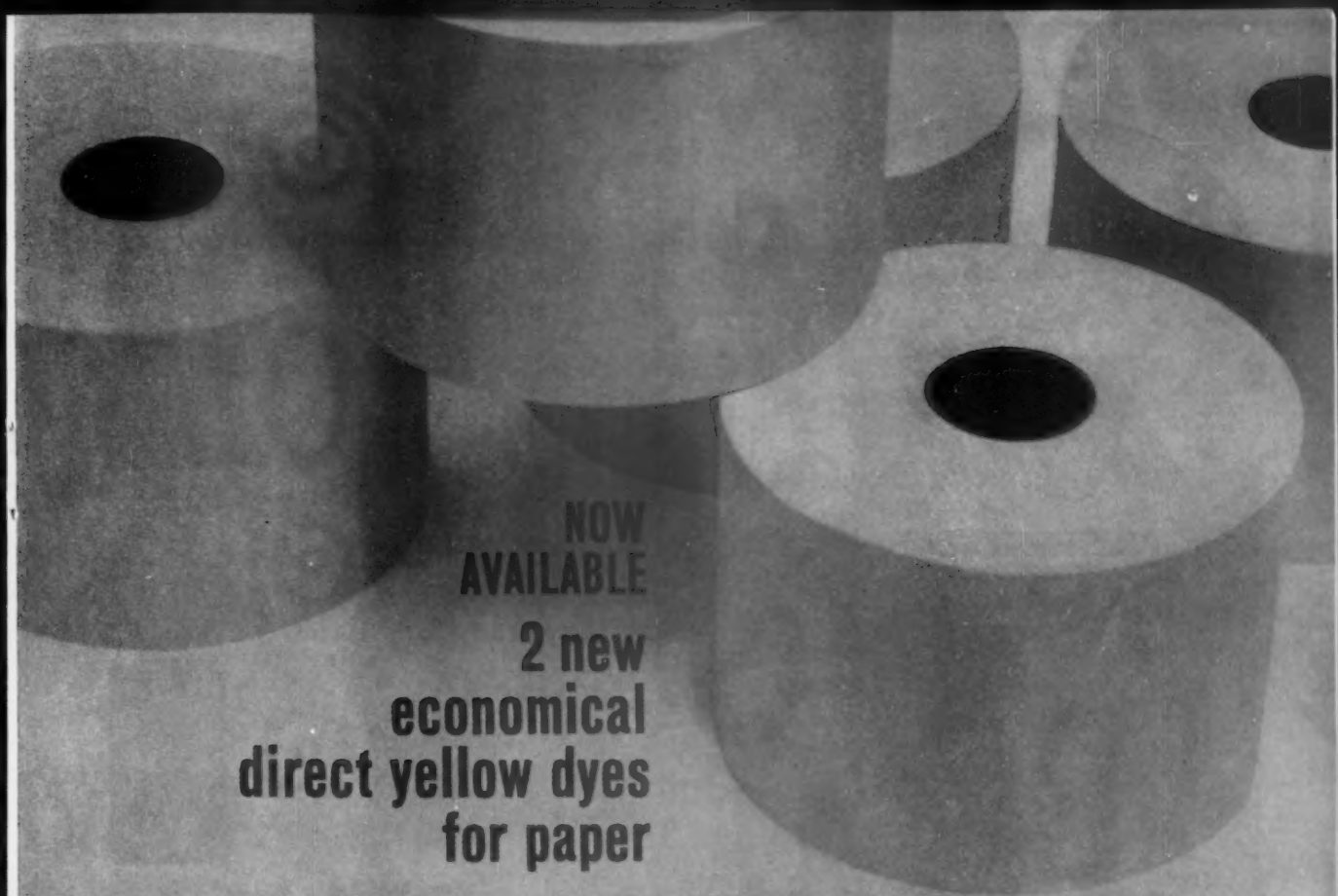
Corydon Wagner (photo), President. He is a principal of Merrill & Ring, Seattle, Wash.

Assn. headquarters at 712 U.S. National Bank Bldg., Portland, Ore. Forest Counsel, H. R. Glascock.

Forest Industries Council

L. J. Kugelman (photo), Chairman. He is in the Public Relations department of International Paper Co., New York

Assn. headquarters at 220 East 42nd St., New York, N.Y. Secy., W. C. Hammerle.



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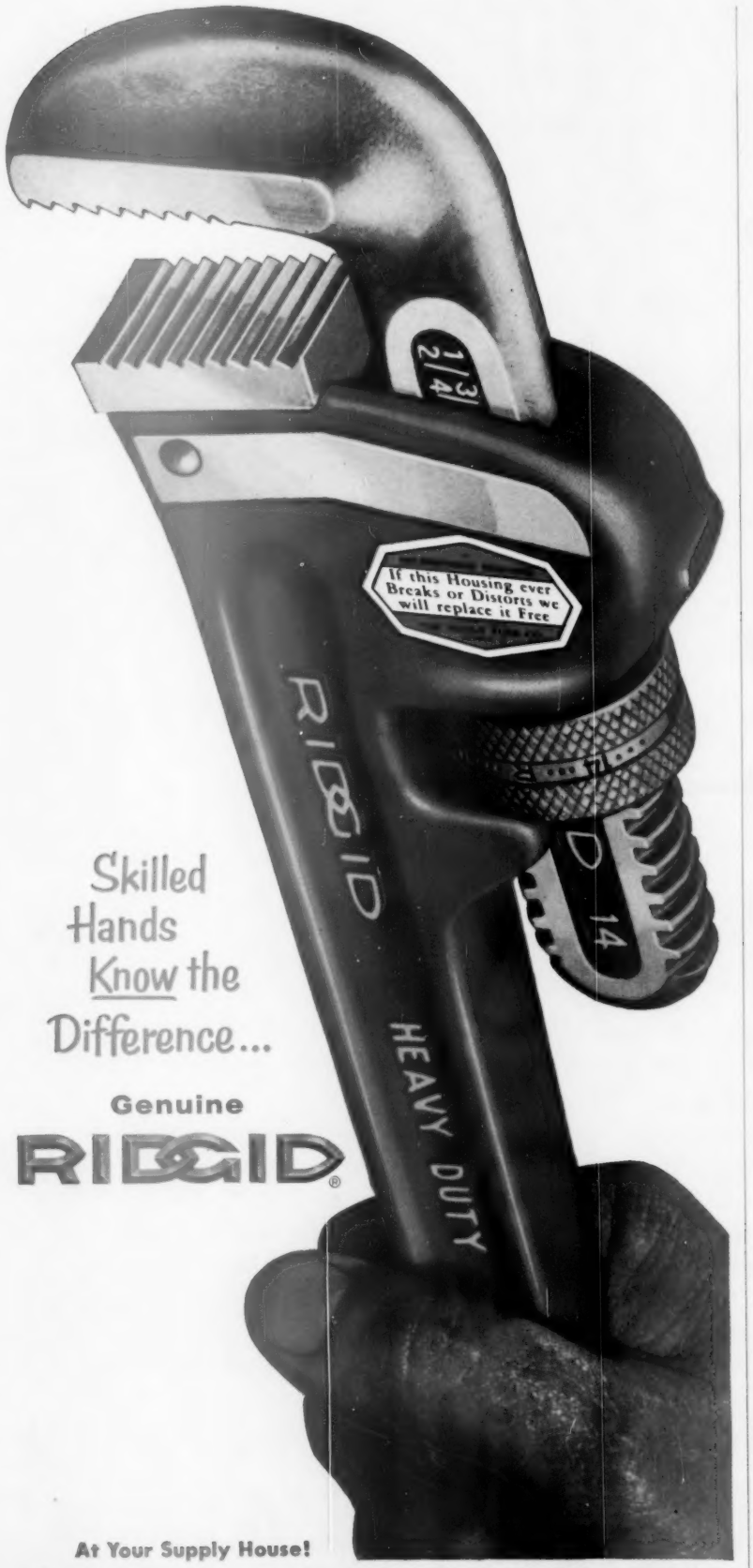
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National Safety Council, Wood Products Section

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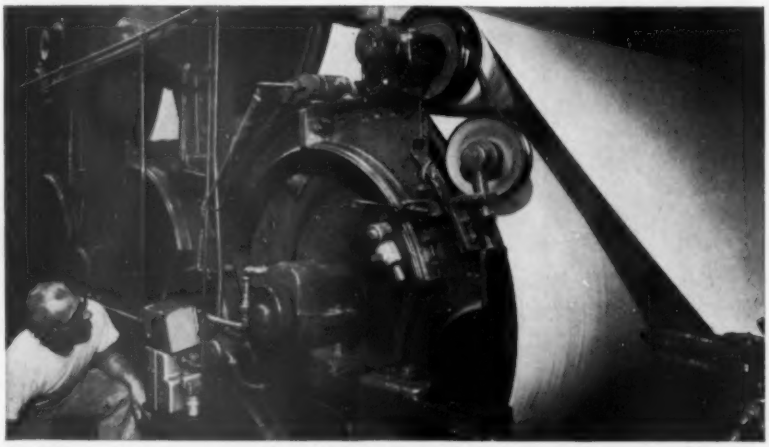

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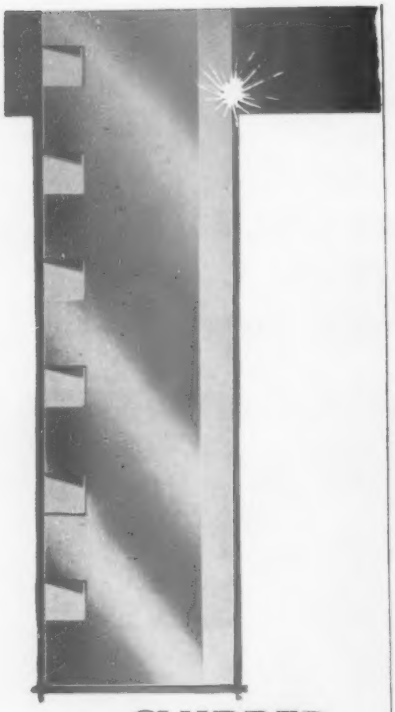

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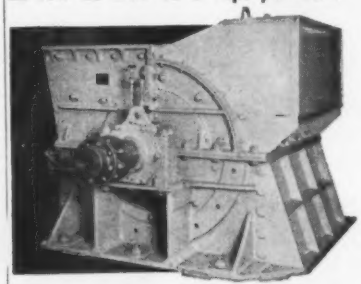

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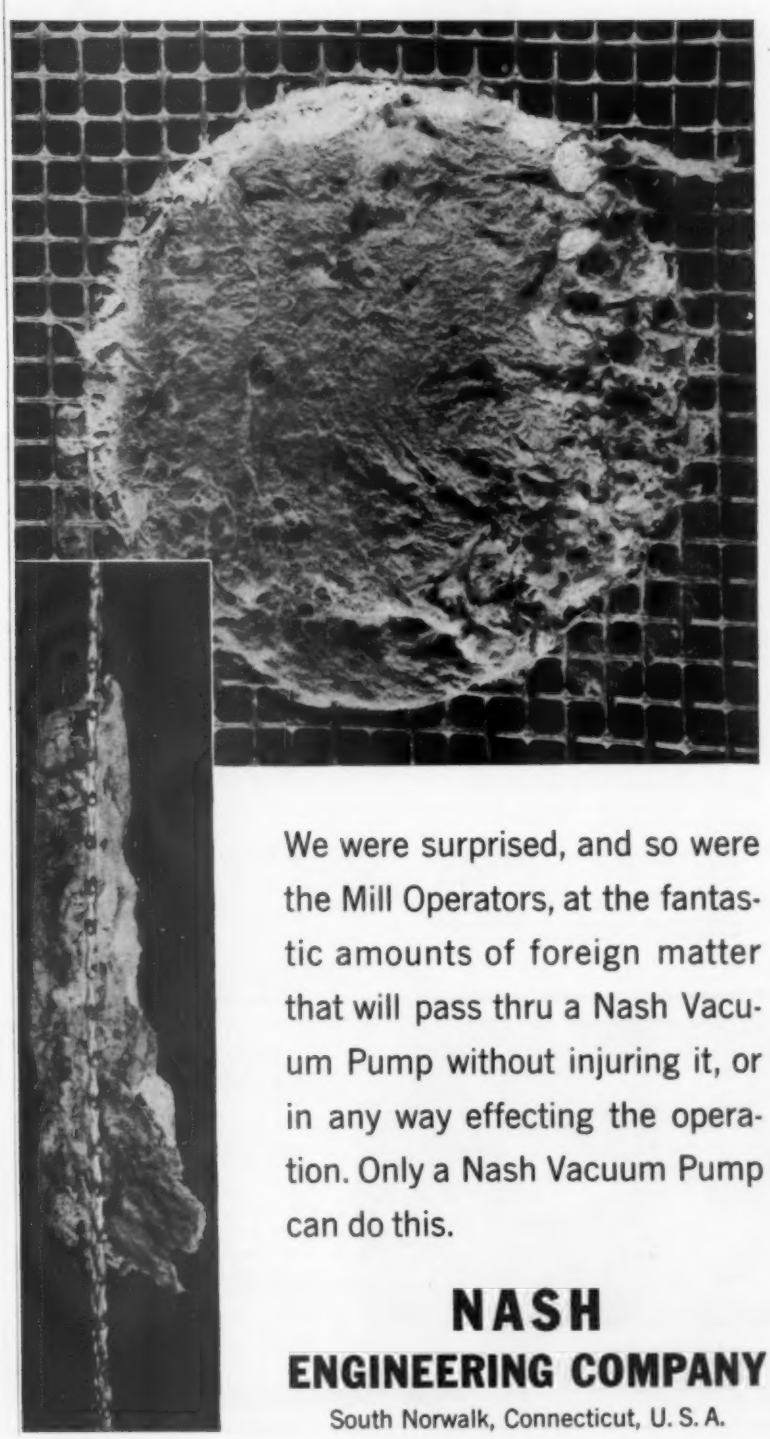

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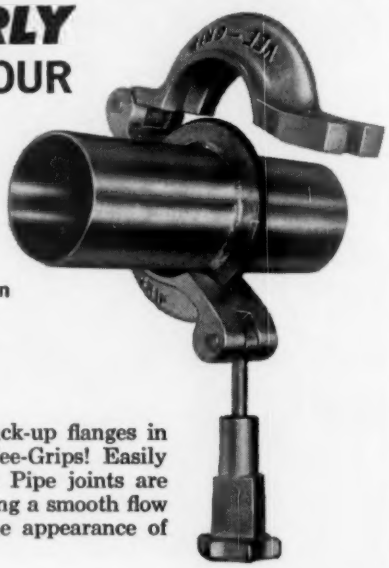

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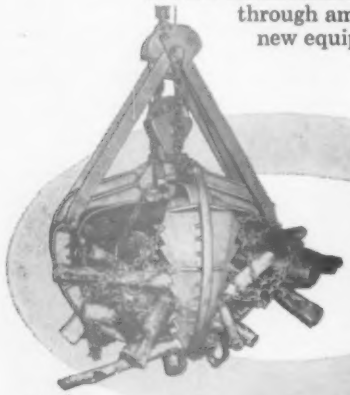

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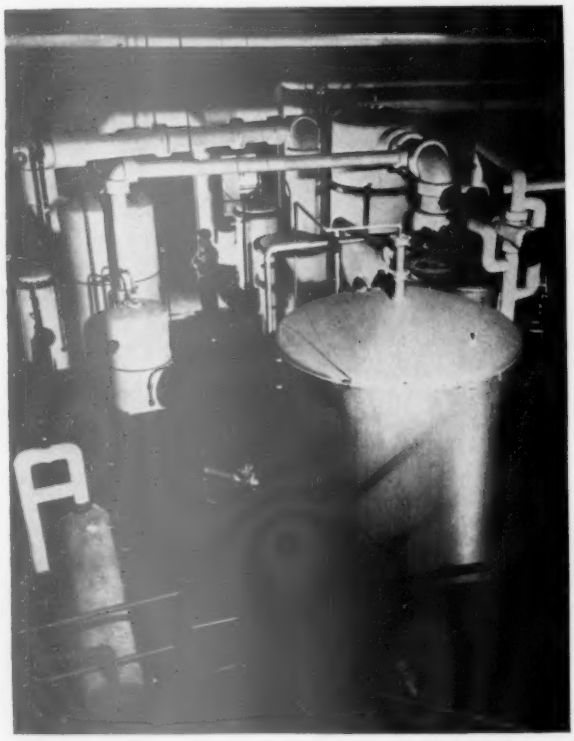

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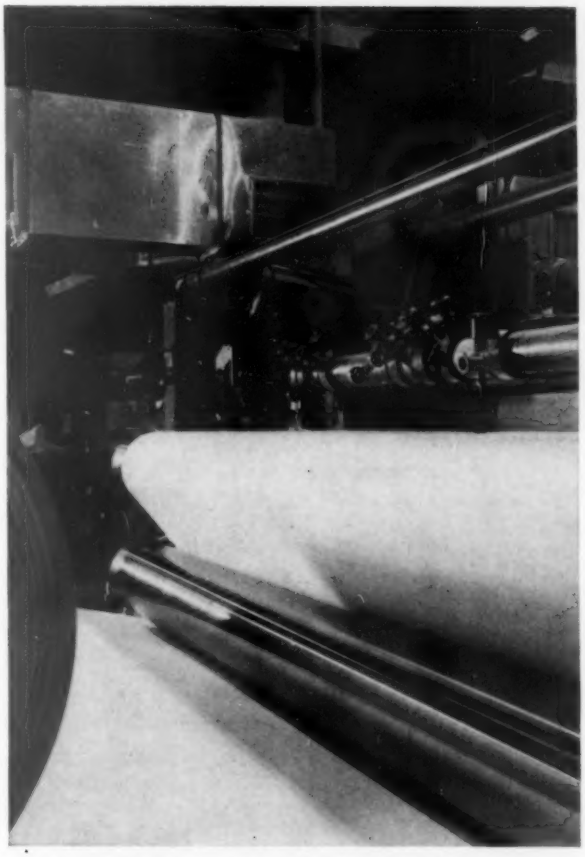

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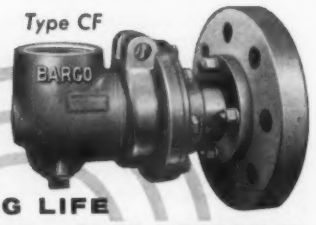

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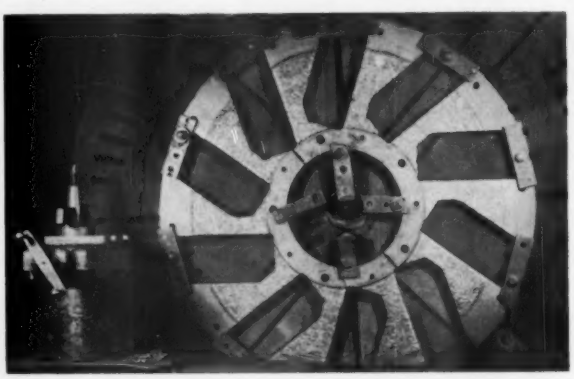

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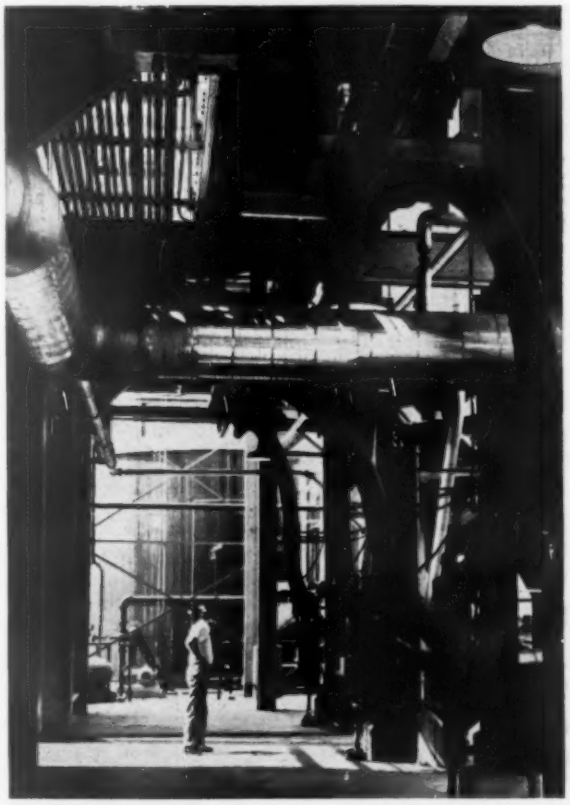

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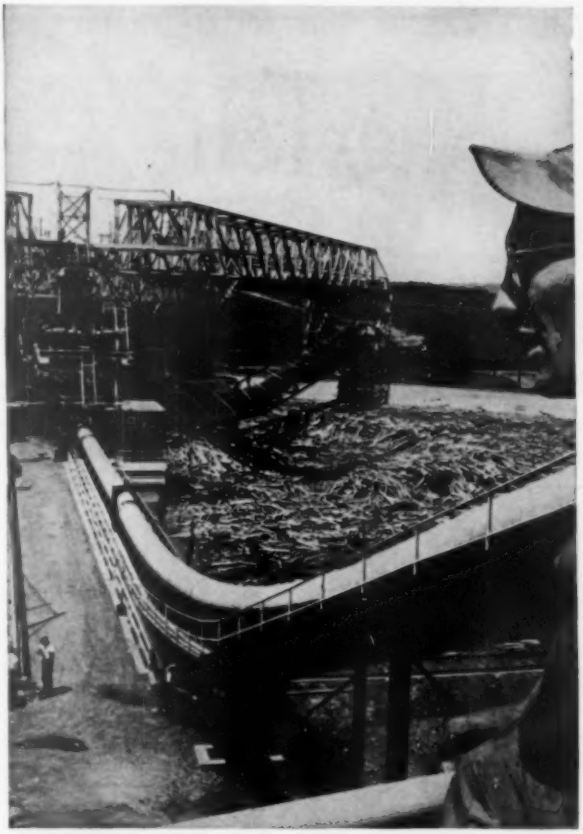

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"Many hands and hearts" contributed . . .

We used this phrase some years back in grateful acknowledgement to the contributors who make this work possible. It is more true today, with more persons participating. There are reports from 101 countries and territories and our own national editors contributed articles on more than half of these for this 11th WORLD REVIEW. It is not an exaggeration to say their "hearts" as well as "hands" were involved. For each of these writers is proud of the privilege of describing and interpreting industry progress in "his own, his native land."

And furthermore, many of them have served their country and this WORLD REVIEW for so long that they have a genuinely sentimental interest in the magazine—it is their "baby," too.

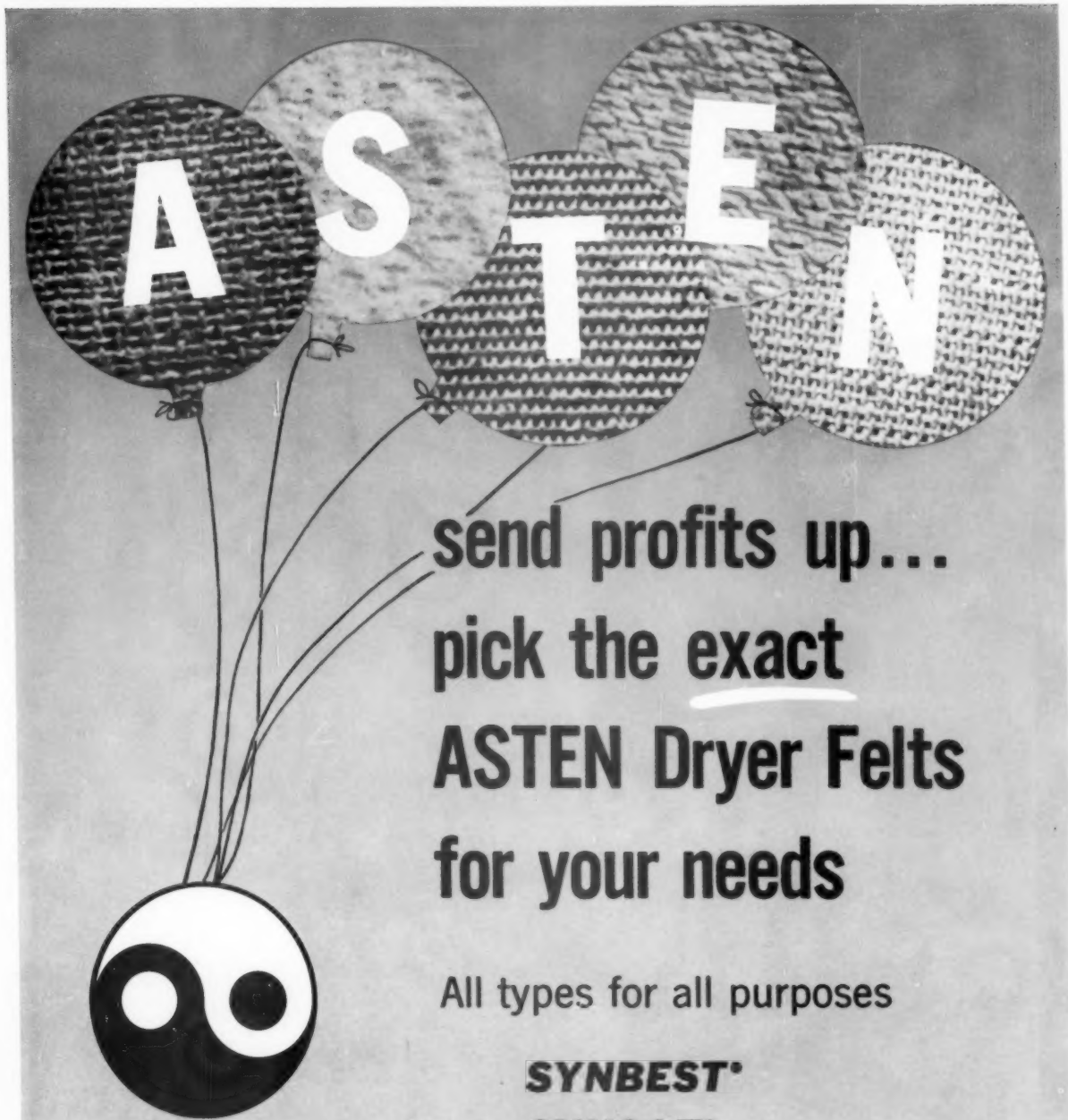
The first national editors

Aside from some of the regular staff members, three of our present national editors began contributing to that very first WORLD REVIEW in 1951 and have continued to do so every year since. They are: Siegfried H. Aeschbacher, for Switzerland, who is president of Balsthal Paper Mills; Henk Voorn, editor of an industry magazine in Holland; Alexander A. Adamson, president and general manager of the biggest company in the Philippines. There were reports from 33 countries in that first WORLD REVIEW, thanks to assistance from associations, major companies or government sources. Don Antonio de Sabates, elderly general manager of La Papelera Española, which makes over half of Spain's paper, should be mentioned, as others in his company have carried on the editorship.

Beginning in 1952 and each year since, William F. Boks, administrator of Gross & Irgens, international pulp sales firm, began writing for Belgium; Dr. R. V. Bhat, then at the Forest Research Institute of India and now technical director of West Coast Paper Mills, for India, and Carlos García Robles, consulting engineer in Mexico City, for Mexico.

Rex Vincent, vice president and technical director, Bulkley, Dunton Pulp Co., has been writing his annual review of the dissolving pulp field for every year, since and including the 1947 issue.

The number of countries and territories covered has steadily risen each year to this year's record number. To all our editors and correspondents in nearly 100 countries, we would like to say "merci beaucoup" for their splendid contributions to our WORLD REVIEW issues.



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